

EXTENSION OF THE CONCEPT OF HORIZONTAL FISCAL EQUITY
TO COMMUNITY COLLEGE PER-STUDENT REVENUES

By

GEORGE WESLEY HARRELL

A DISSERTATION PRESENTED TO THE GRADUATE SCHOOL
OF THE UNIVERSITY OF FLORIDA
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

UNIVERSITY OF FLORIDA

1992

UNIVERSITY OF FLORIDA LIBRARIES

FOR
ANDREA

ACKNOWLEDGMENTS

I would like to thank Dean Madelyn Lockhart for her support that ultimately led to this Ph.D. I would like to thank distinguished service professor and chairman of my doctoral committee, Dr. James L. Wattenbarger, who tweaked my interest in higher education administration, was supportive of my efforts, and was very generous with his time throughout this process. I would like to thank Dr. David S. Honeyman, cochair of my committee and mentor in the area of education finance, for his support. I would like to thank Dr. R. Craig Wood, department chairman and committee member, for his support and zeal for precision; I hope it was contagious. I would like to thank Dr. John H. James for serving on my committee and for bringing humanity in business back into focus during the MBA program. I would like to thank Leila Cantara, Cathy Carroll, Christina Aslan, Phyl Schmidt, Helen Martin, and Linda Cowart for always having the right piece of paper at the right time, patience with me, solutions for all my problems, and just the right word at the right time.

The support and encouragement of my wife, Andrea, daughter, Jennifer, and son, Wesley made this possible and worth the effort. And finally, I would like to thank my mother and father for their support of my educational goals.

TABLE OF CONTENTS

	<u>page</u>
ACKNOWLEDGMENTS	iii
ABSTRACT	vii
CHAPTERS	
ONE BACKGROUND OF THE STUDY	1
Introduction	1
Statement of the Problem	5
Purpose of the Study	7
Overview of the Methodology	8
Limitations and Delimitations of the Study	11
Definition of Terms	12
Significance of the Study	15
Overview of the Study	16
Organization of the Study	16
TWO REVIEW OF RELATED LITERATURE.	18
Introduction	18
Equity	19
Measurement of Equity	27
Community College Funding Methodologies	31
Formula Budgeting	32
Sources of Revenue	34
Florida Funding Methodology	40
Summary	42
THREE RESEARCH METHODOLOGY.	44
Introduction	44
Population of the Study	47
Methodology: Horizontal Fiscal Equity Measurement	49
Range	50
Restricted Range	51
Federal Range Ratio	51
Coefficient of Variation	52
McLoone Index	53
Gini Coefficient	54

	Lorenz Curve	55
	Methodology: Equity Trend.	55
	Research Design: Total Revenue Equity Trend.	57
	Research Design: Revenue Source Equity	
	Trend	59
	Summary	61
FOUR	ANALYSIS OF DATA	62
	Introduction	62
	Total Revenue Equity	63
	Gini Coefficient	63
	Coefficient of Variation	65
	McLoone Index	66
	Federal Range Ratio	68
	Restricted Range	69
	Range	71
	Lorenz Curve	72
	Total Revenue Equity Summary	75
	Revenue Sources Equity Trend	77
	Gini Coefficient	78
	Coefficient of Variation	80
	McLoone Index	82
	Federal Range Ratio	85
	Revenue Sources Equity Trend Summary	87
	Revenue Sources Relative Horizontal Equity	89
	Gini Coefficient	90
	Coefficient of Variation	90
	McLoone Index	91
	Federal Range Ratio	92
	Revenue Sources Relative Equity Trend Summary	94
	Summary	95
FIVE	OBSERVATIONS AND CONCLUSIONS	96
	Introduction	96
	Total Revenue Equity Trend	97
	Revenue Sources Equity Trend	100
	Conclusions and Implications of the Study	104
	Recommendations	106
	Recommendations for Further Study	107
APPENDICES		
A	RAW DATA	109
B	COMMUNITY COLLEGES USED IN THE STUDY	134
C	COMMUNITY COLLEGE PROGRAM FUND	137
D	EXPENSE/REVENUE RELATIONSHIP.	141

REFERENCES	150
BIOGRAPHICAL SKETCH	158

Abstract of Dissertation Presented to the Graduate School
of the University of Florida in Partial Fulfillment of the
Requirements for the Degree of Doctor of Philosophy

EXTENSION OF THE CONCEPT OF HORIZONTAL FISCAL EQUITY
TO COMMUNITY COLLEGE PER-STUDENT REVENUES

By

George Wesley Harrell

May, 1992

Chairman: James L. Wattenbarger
Cochairman: David S. Honeyman
Major Department: Educational Leadership

The purpose of this study was to extend the discussion of horizontal fiscal equity as it relates to public K-12 education to the multiple institution public community college system. The research dealt with examining and analyzing the trend of horizontal equity based on per-student revenues and per-student revenue by source. This study was focused on the extension of the concept of per-student horizontal fiscal equity to the general current fund budget category revenues of the 28 institution community college system of the State of Florida.

Horizontal equity, in the context of education finance, is the "equal treatment of equals." Equity was recognized as one of the goals of community college funding. The horizontal fiscal equity measurement methodologies used for

public K-12 education were utilized in this study. The six measures used were the range, restricted range, federal range ratio, coefficient of variation, McLoone index, and Gini coefficient. The analysis of horizontal fiscal equity was extended to the major revenue sources, the Community College Program Fund (CCPF), student fees, and all other sources (representing approximately 65%, 25%, and 10% of revenues respectively). Time series linear regression analyses were used to examine the temporal trend in equity over the 10-year period utilized in this study, fiscal years 1980-81 through 1989-90.

Total per-student revenues were found to have an increasing equity trend based on three equity measures, the Gini coefficient, coefficient of variation, and McLoone index, an inconclusive trend based on the federal range ratio, and a decreasing equity trend based on the range and restricted range. The CCPF was found to be the most equitable revenue source, followed by student fees, and the revenue source, other, based on the Gini coefficient, coefficient of variation, and federal range ratio, and the McLoone index indicated that student fees and the other revenue source were in the reverse order. The State of Florida community college per-student revenues were found to have a 10-year trend toward increased horizontal fiscal equity except for range related equity.

CHAPTER ONE

BACKGROUND OF THE STUDY

Introduction

The importance of community colleges to the higher education process and system was summarized by Taylor (1985) as follows:

the state role in the funding of community colleges is of direct importance to nearly five million students (40% of all postsecondary students), a quarter million teachers, much of corporate America, and nearly every American taxpayer. It is an educational topic that spills into the tangential areas of social access and mobility, the national economy, American technology, and even "a nation at risk." (p. 43)

Brookings Institute President Bruce K. Maclaury (1981) wrote that the "two-year colleges" were "a significant and vital part of the nation's diverse system of higher education" (p. vii).

There was continuing concern expressed in the literature for the financial crisis facing community colleges. The problem was not new; Lombardi (1971), concerned with adequacy of funding for community colleges, wrote The Financial Crisis in the Community College, and Kintzer (1980), concerned with the impact of Proposition 13 on community colleges, wrote Proposition 13: Implications for Community Colleges. Martorana and Wattenbarger (1978)

indicated that community colleges have "experienced increasing financial uncertainty" due to the "pressures on public support to postsecondary education" (p. 386), and Lombardi (1979) indicated that the "lean years" were facing the community colleges in the "post-proposition 13 era" (n.p.).

The community college funding problem was not isolated or limited to Florida; the problem was national in scope. It was reported by El-Khawas, Carter, and Ottinger (1988) that nationally the current-fund expenditures per full-time equivalent student (FTE) for 2-year public institutions had increased only "4.8%," in constant dollars, in the period 1970-71 to 1984-85 (p. 34).

Gold (1990) indicated that higher education is the "second largest component of state budgets" and as "such a major component of state spending," the "general state fiscal conditions are the most important determinant of state support" (p. 21). The economic downturn of the economy in the United States had further impaired the ability of many states to finance postsecondary education.

State legislatures had sought to determine the optimal funding method, but no generally accepted "best" method could be found in the literature. Criteria for judging methods had been proposed by several researchers including Martorana and Wattenbarger (1978) and Garms (1977).

State funding had been categorized into six subcategories of the three funding methodologies for public community colleges (Wattenbarger & Starnes, 1986). In the period 1988 to 1990 "eight states reported that they have changed to a formula-based allocation scheme" (Honeyman, Williamson, & Wattenbarger, 1991, p. 5). Formula budgeting is the "prevalent approach to allocating state resources to colleges and universities" (Ahumada, 1990, p. 467). McKeown (1986) indicated that a majority of states used funding formulas for higher education resource allocation. A state system using a form of formula budgeting, as defined in this study, was selected for this research. The rationale for using a formula budgeting state was because of the broad applicability of the results, since most states have used or will use a form of formula budgeting for allocating community college funding to each institution within the respective state system. As reported by Honeyman et al. (1991) and McKeown (1986), the current trend in funding community colleges has been toward formula funding. The question of equity, as defined as "equal treatment of equals under equal circumstances," has been raised relative to the results of the formula budgeting processes in effect in many state postsecondary education systems (McKeown, 1986, p. 63). The "equal treatment of equals" was called "horizontal equity" by Berne and Stiefel (1984, p. 13), Jones (1985, p. 56), Jordan and McKeown (1980, p. 102), and Wood, Jones, and

Riley (1984, p. 4). McKeown (1986) stated that the purpose of using formulas was to accomplish the "equitable distribution of available state funds" (p. 65).

Wattenbarger and Mercer (1988) and Jones and Brinkman (1990) indicated that equity is one of the principles sought by states in developing procedures for funding community colleges.

The inequality of funding has been recognized by others. Kerr (1980) indicated the need to raise "significantly the comparative level of financing of the least well financed institutions" (p. xii). The equity question has many facets in higher education. Woodbury (1983) was a proponent of the cost-effectiveness approach to allocating between sectors of higher education. Educational equity has been listed by Wattenbarger (1991) as one of the three goals of higher education and further noted that community colleges have been attentive to the goal.

Breneman and Nelson (1981) in discussing community college financing stated that "equitable distribution of educational opportunities" was better served by student equity than by taxpayer equity (p. 122), and further reported that states should "reduce the disparity in local resources available per (community college) student" (p. 125). Garms (1977) listed interdistrict equity as one of the criteria for community college funding methodologies. Nelson (1982) in the chapter titled Equity and Higher

Education Finance: The Case of Community Colleges said that community colleges are the "sector of higher education with the closest kinship to elementary-secondary schooling" (p. 215). "Revenues per student" and "interdistrict equity at the community college level" were stated to be "quite similar" to the "school finance reform movement" as it related to "educational opportunity" (Breneman & Nelson, 1981, p. 121).

The utilization of the equity measuring techniques, prevalent in evaluating K-12 public education per-pupil horizontal fiscal equity, for examining and analyzing community college per-student horizontal fiscal equity was based on the similarities of the systems and the need to measure the distribution disparity of per-student revenues and revenue sources. The purpose of evaluating the horizontal equity was a response to the equity goals for funding community colleges (Breneman & Nelson, 1981; Jones & Brinkman, 1990; Kerr, 1980; McKeown, 1986; Nelson, 1982; Wattenbarger & Mercer, 1988).

Statement of the Problem

Per-student fiscal equity has generally been accepted as one of the goals for funding community colleges (Breneman & Nelson, 1981; Jones & Brinkman, 1990; Kerr, 1980; McKeown, 1986; Nelson, 1982; Wattenbarger & Mercer, 1988). In a state system of community colleges where the commonality of institution mission and funding was the state goal, the

ability to measure, contrast, trend, and compare the per-student allocation of funds or student funding equity was required by legislative bodies and the public.

The preponderance of the research on per-student fiscal equity has dealt with public K-12 school systems and has been fueled by the "fierce litigation" associated with equal opportunity and district wealth redistribution (Camp, Thompson, & Crain, 1990, p. 289). The litigation basis was also supported by Vacca (1975).

The problem was that achievement of horizontal equity in community college per-student funding required the ability to measure and evaluate the effect of legislative funding action on community college systems using recognizable techniques. Gurwitz (1982) said that "to determine whether expenditures have or will become more equal and by how much, we need measures of equity" (p. 179). Equity may be measured using several different indexes but the basic concept is to compare distributions. Gurwitz (1982) further indicated the need to have a recognizable method of evaluating "movement in the direction of equality" and not to "strive for perfect expenditure equality" (p. 179).

The problem found was that for multiple institution public community college systems, there had not been any studies reported that had evaluated horizontal fiscal equity utilizing recognized methods of evaluating equity, examining

equity measures for applicability, or analyzing the temporal trend of horizontal equity for a community college system over a multiple year period. A study was needed to extend the discussion of horizontal fiscal equity to the multiple institution public community college system. A study was needed to analyze and examine whether the Florida Community College system had been meeting the reasonable standard of horizontal equity and to evaluate the horizontal equity trend of the community college system over a multiple year period. The study needed to accomplish the analysis through the application of the recognized per-pupil horizontal fiscal equity measurement techniques.

Purpose of the Study

The purpose of this study was to extend the discussion of horizontal fiscal equity as it relates to public K-12 education to the multiple institution public community college system by analyzing selected horizontal equity measures and examining the temporal trend of the horizontal equity over a 10-year period. This study was focused on per-student total revenues that resulted from the distribution of the major current general fund revenue sources (state foundation funding formula, student fees, and other revenue) in the multiple institution public community college system of the State of Florida. To investigate this issue, research questions were developed as follows:

1. Was there a trend in per-student horizontal fiscal equity, based on per-student total revenues, for the state's public community college system for the fiscal year periods 1980-81 through 1989-90 based on the K-12 public education per-pupil fiscal equity measurement criteria for horizontal equity?

2. Was there a trend in per-student horizontal fiscal equity for the three major components of revenues (i.e., the foundation funding provided by the state; student fees; and other sources) for the 10 fiscal year period based on the K-12 public education horizontal fiscal equity measurement criteria; in addition, what was the contribution of the three major components of revenue to the total per-student horizontal fiscal equity?

Overview of the Methodology

This study was focused on the extension of the concept of horizontal fiscal equity through the application of K-12 horizontal equity measurement methods to the multiple institution public community college system per-student horizontal fiscal equity. This study included the application of the recognized horizontal fiscal equity evaluation criteria, used in evaluating K-12 horizontal fiscal equity, for the purpose of examining and analyzing community college per-student revenue and revenue source horizontal fiscal equity trends over a 10-year period.

The research methodology employed in this study was nonexperimental. This study utilized population data. These raw data for the population utilized in this study are listed in Appendix A. The 28 institutions that comprised the State of Florida Department of Education Division of Community Colleges used in this study are listed in Appendix B (Florida Statutes §240.3031, 1991; State of Florida Bureau of Information Systems, 1991). The number of community colleges in the system has remained constant at 28 since 1972 when the "master plan had been implemented" (State of Florida Bureau of Information Systems, 1991, p. 1). This study utilized the ten fiscal year periods from 1980-81 to 1989-90. Fiscal year 1989-90 was the most recent year for which data were available.

In order to investigate research question number one, the per-student total revenue fiscal equity was analyzed and examined using the K-12 public education per-pupil revenue disparity criteria for horizontal equity, as described by Wood et al. (1984), the range, and restricted range (Berne and Stiefel, 1984; Gurwitz, 1982). The FTE data and the revenue data for each institution were used to calculate the per-student revenues for each institution for each of the 10 years of this study.

The per-student revenues for each institution of the state for each year were used to calculate the range, restricted range, coefficient of variation, McLoone index,

federal range ratio, and Gini index. The Lorenz curve was plotted to depict the Gini index. The value for each indicator was calculated for each year of this study. The six selected indicators were examined and analyzed.

Linear regression of the time series for each measure was used to examine and analyze the linear relationship of each indicator over the 10-year period of this study. The algebraic sign of the slope was used to evaluate the trend of the equity measure over the 10-year period.

In order to investigate research question number two, the major revenue components were identified. The major components of total current revenues were the Community College Program Funding (CCPF), student fees, and other revenues (State of Florida Bureau of Information Systems, 1991). Other revenues included other state revenues, other local revenues, and federal revenues (State of Florida Bureau of Information Systems, 1991). Per-student revenues by major component for each institution for each year of this study were calculated. The CCPF methodology (see Appendix C) and revenue sources used by the State of Florida Community College Division are described later in this study. The per-student revenue values for each of the three major revenue components for each institution of the state for each year were used to calculate the Wood et al. (1984) horizontal equity measures (coefficient of variation, McLoone index, federal range ratio, and Gini index).

The Lorenz curve, range, and restricted range were not used in this part of the analysis. Each value for each indicator was calculated for each year of this study.

Linear regression of the time series for each measure was used to examine and analyze the linear relationship of each indicator over the 10-year period of this study. The algebraic sign of the slope was used to evaluate the trend of the equity measure over the 10-year period.

For the second part of question two, time series linear regression analysis was used to examine the relative equity of the three revenue components to the resulting per-student total revenue equity for each of the four equity measurement indicators during the 10-year period. The relative location of the time series linear regression line and the slope of the revenue source time series linear regression lines in relationship to the total equity time series linear regression line for each indicator were used for this part of the analysis.

Limitations and Delimitations of the Study

This study was limited to the equity concept of horizontal equity. This study was limited to the State of Florida Community College System; the focus was upon a state system with a multiple institution public community college system that had a stated goal of a common academic mission, common funding objective, and common funding methodology for all institutions within the community college system.

The tests of equity were limited to the six most widely used and recognized statistical techniques currently employed to evaluate public K-12 education per-pupil funding equity. The data were limited to the data for the 10 fiscal years from 1980-81 to 1989-90 for the 28 institutions that comprise the public community college system of the State of Florida.

Annual expenses were limited to the fiscal year education and general current fund expenditures, annual revenues were limited to education and general current fund revenues, and the annualized school year FTE was based on a 40 credit hour per year equivalent student as reported. Intrastate comparisons between years are permissible and are an integral part of this study. The methodology used in this study is applicable and exportable to other state systems that meet the selection criteria; however, direct interstate comparisons of these results are not within the scope of this study.

Definition of Terms

The following definitions are for clarification and to ensure precision in interpreting this study, and as such, may apply only for the purpose of this study.

Funding methodology refers to the method of allocating funds to the individual institutions within a multi-institution public community college system. In the context of this study funding methodology refers to all rules and

regulations set forth that affect the generation of revenues by the institutions. Funding methodology in this study includes all legislation and regulation that pertained to foundation funding, student fees, and other revenues.

General current fund was defined as "the fund used to account for resources that are available for the general financial requirements of the college, the only restrictions being those imposed by law or the budget" (State of Florida Bureau of Information Systems, 1991, p. 68).

Community College Program Fund (CCPF) is defined as "those monies allocated by the Legislature [of the State of Florida] to operate the colleges for the next fiscal year" (State of Florida Bureau of Information Systems, 1991, p. 67).

Horizontal equity refers to the "equal treatment of equals" (Jones, 1985, p. 56). More specifically, per-student funding horizontal equity refers to equitable expenditures and revenues for equal students independent of the particular institution attended by the student within the community college system. The significance of horizontal equity in the context of this study is the equal opportunity that is afforded each student.

Formula budgeting refers to a budget allocation technique that uses, in whole or in part, units of production (such as full-time equivalent enrollment (FTE)) multiplied by a dollar value per unit of production to

obtain the budget allocation for the institutions within the system. The allocation is not dependent on the institution at which the production occurs.

Full-time equivalent (FTE) enrollment (annualized) refers to the measure of effort in credit hours that a full time student would require or the unit of production associated with a full time student on an annual basis. For the Florida Community College Division the FTE value was defined as "student semester hours divided by 40 for Advanced and Professional, Postsecondary Vocational instruction," and "for all other instruction, 900 instructional hours equate to 1 FTE" (State of Florida Bureau of Information Systems, 1991, p. 68). The measurement of FTE must have been consistent within each community college system to allow horizontal equity measurement on a per-student basis, but may vary between systems.

Per-student fiscal equity refers to the horizontal equity of expenditures or revenues for any student attending any particular institution in a multiple institution public community college system. Per-student expenditures or revenues were determined by dividing total fiscal year education and general current fund expenditures or revenues by the corresponding period's annual equivalent FTE.

Significance of the Study

The importance of community colleges to the education system and the goal of equitable distribution of funding to community colleges has been substantiated in the literature. However, without specific models and techniques to evaluate per-student horizontal fiscal equity in multiple institution public community college systems, state legislators lacked the basis for making proper decisions to attain or improve fiscal equity in the community college segment of a state's higher education system. This analysis would be expected to yield results that would provide a basis for examining the horizontal fiscal equity trend resulting from the available revenues and revenue sources allocated by the states. The techniques employed in this study could be used to analyze the effect on per-student horizontal fiscal equity of pending legislative budget actions that relate to community college funding.

State legislators would be able, not only to determine, but also to predict if the funding proposed for community colleges would alter per-student horizontal equity. Legislators would be able to evaluate proposed changes in funding methodology to determine if the changes would result in a more equitable distribution of funds to the public community colleges within a state system. The study should provide the basis for legislative bodies to address equity in funding community colleges and should provide a method of

evaluating the effectiveness of the actions taken to ensure equity.

Overview of the Study

A comprehensive review of existing literature was conducted to determine if the research already existed; or if not, to determine if the techniques and methodologies that were needed to solve the problem were available. It was determined during the review of the literature that similar problem solutions could be found in K-12 horizontal equity measurement studies that would be applicable as methodology appropriate to this research.

The researcher obtained data on the funding methodology employed by the state, total annual revenues and expenditures by institution, annual revenues by source, and annual FTE by institution. The research design of this study was nonexperimental and utilized population data for the period covered by this study. No similar studies of horizontal fiscal equity for community colleges were found in the literature; however, the techniques and horizontal equity measures utilized in this study were found in the K-12 literature.

Organization of the Study

This study consists of five chapters and associated appendices. Chapter Two contains a review of the germane literature that includes the following topics: equity, equity measurement, community college funding methodologies,

formula funding, sources of community college revenues, and related topics. The research methodology employed by the researcher is described in Chapter Three and includes the data sources and statistical techniques used in this study. Chapter Four contains the analysis of the data used in this study, and Chapter Five includes the conclusions, observations, and recommendations for further study. The appendices contain the raw data, list of community colleges used in this study, description of the State of Florida Community College Program Fund (CCPF), and other related information.

CHAPTER TWO
REVIEW OF RELATED LITERATURE

Introduction

This chapter contains the results of the literature search of the topics that were germane to the research. The research centered on the extension of the discussion of horizontal fiscal equity to the per-student revenues of a multiple institution public community college system. The research dealt with the techniques required to analyze the relative level and temporal trend of per-student horizontal fiscal equity that resulted from the actual available revenues and revenue sources that were allocated to a multiple institution public community college system.

Specifically, the review of literature focused on topics relevant to the equitable distribution of revenues within a multiple institution public community college system. The 28 institutions of the State of Florida, Department of Education, Division of Community Colleges were used in the study. The 28 institutions are defined in Florida Statutes §240.3031 (1989) and are listed in Appendix B, Table B-1.

The importance of community colleges to the higher education process and system has been stated previously

(Taylor, 1985). Taylor (1985) emphasized the scale of the community college systems and that "40% of all postsecondary students" make use of community colleges (p. 43). Brookings Institute President Bruce K. Maclaury (1981) wrote that the "two-year colleges" were "a significant and vital part of the nation's diverse system of higher education" (p. vii).

The review of the relevant literature is presented by topic in this chapter. The main areas of concern included equity and the application of equity to education, equity measurement techniques and indices, community college funding methodologies and trends, and the sources of revenue for community colleges.

Equity

The concept of equity was not a recent addition to education finance. Elwood Cubberly, 1902, was attributed with having been "the first to suggest the concept of fiscal equalization of educational opportunity" (Wood, Jones, & Riley, 1984, p. 3). Jordan and McKeown (1980) further contributed Cubberly with the "concept of fiscal equalization of educational opportunity" (p. 99).

There were numerous definitions and categorizations of equity found in the literature. In Webster's New Collegiate Dictionary (1981) the definition of equity includes the phrase "freedom from bias or favoritism" (p. 383). Alexander (1982) indicated that equity encompassed "justice, equality, humanity, morality, and right" (p. 194).

Alexander (1982) also indicated that equitable treatment may have had as a basis the "natural law of Thomas Aquinas," "the utility of Jeremy Bentham," or the "Rawlsian concepts of freedom and justice" (Alexander, 1982, p. 194).

Equity and equality while synonyms were not interchangeable terms in education finance. In the context of education, Coons (1980) stated that there was "no virtue simply to achieve equality" (p. 134). Burrup, Brimley, and Garfield (1988) stated that "public education systems are designed to produce equity (fairness)" but further stated that "they do not, cannot, and should not aspire to produce complete equality" (p. 10). Alexander (1982) also indicated that "equity was more than equality" (p. 195) and categorized equity as commutative, as in right of ownership, and distributive, as in social redistribution. The latter aspect was of interest in education finance.

McMahon (1982) defined equity as "involving a redistribution of resources (or of costs) designed to achieve a community's philosophical and ethical standard of fairness" (p. 16). McMahon (1982) described three types of equity (horizontal, intergenerational, and vertical) that encompassed child equity, and further discussed staff equity and tax equity in the education context.

A hierarchy of equity was proposed by Alexander (1982), and consisted of Commutative Equity, Equal Distribution, Restitution, and Positivism. Commutative has been

previously discussed; Restitution included a condition or requirement of compensation for past inequity, and Positivism dealt with vertical equity in that the unequal needs should be "fully financed" (p. 212). The Equal Distribution dealt with districts having "access to the same amount of money per pupil" (Alexander, 1982. p. 213). McMahon (1982) described a hierarchy similar to that of Alexander (1982) that consisted of Commutative Equity, Fiscal Neutrality, Proportionality, and Positivism. Concerning the legal basis of equity in education finance, Alexander (1982) stated that

the concepts of equity in education in the United States today sprang from the common weal and good conscience interpretations of the courts in reference to constitutions and statutes of the various states and the federal government. (p. 199)

Based on an analysis of the legal opinions beginning with Serrano (1971), Alexander (1982) proposed a "School Finance Equity Model" that stated that "a basic formula adjustment which will fully fiscally equalize" was the "most important single element in the determination of equity" (p. 205).

Guthrie, Garms, and Pierce (1988) stated that "one can think of equity as composed of horizontal equity and vertical equity" (p. 302). In the context of educational equity, horizontal equity has been defined as "equal treatment of equals" by Jones (1985, p. 56). Horizontal equity or horizontal fiscal equity is the theory used in this study. The other aspect of equity, vertical equity,

"unequal treatment of unequals" was not considered in this study (Jones, 1985, p. 56). "Educational equity" was one of the three goals which have been adopted by American higher education (Wattenbarger, 1991, p. 114).

As previously noted in this study, the current trend in funding community colleges has been toward formula funding; however, the question of equity, defined as "equal treatment of equals under equal circumstances," has been raised relative to the results of the formula budgeting processes in effect in many state postsecondary education systems (McKeown, 1986, p. 63). The "equal treatment of equals" concept was referred to as "horizontal equity" by Berne and Stiefel (1984, p. 13), Jones (1985, p. 56), Jordan and McKeown (1980, p. 102), and Wood et al. (1984, p. 4). Alexander (1991) reported eight principles for treating "like cases alike and unlike cases differently" (p. 291). McKeown (1986) stated that the purpose of using formulas was to accomplish the "equitable distribution of available state funds" (p. 65). Wattenbarger and Mercer (1988) and Jones and Brinkman (1990) indicated that equity was one of the principles sought by states in developing procedures for funding community colleges. Educational equity was listed by Wattenbarger (1991) as one of the three goals of higher education and that community colleges have been attentive to the goals.

The inequality of funding had been recognized by others. Clark Kerr (1980) indicated the need to raise "significantly the comparative level of financing of the least well financed institutions" (p. xii). The equity question has many facets in higher education. It was not endorsed in its entirety by all. Woodbury (1983) was a proponent of the cost-effectiveness approach to allocating resources between sectors of higher education, and Camp, Thompson and Crain (1990) indicated that "society has wavered between demands for equity and excellence" but that the "positive influence of resources on opportunity has not wavered" (p. 289). Wattenbarger (1985) reported the "rivalry between community colleges and other elements of society needing public funds" (p. 252), and the "trends in public finance which influence the support pattern for community junior college education" (Wattenbarger, 1966, p. 92). Vader (1985) reported that "changes in sources of revenues at community colleges were usually a result of changes in state funding or fiscal restraints imposed by the state legislature" (p. 111).

Alexander (1990) wrote of "two conflicting motives" in the "driving need for equality" and the "compelling desire for freedom" (p. 299). Friedman and Wiseman (1980) also indicated that equity concepts were "not all consistent" (p. 36). McMahon (1982) stated that "inefficiency and inequity

currently permeate much of primary, secondary, and higher education" (p. 2).

Breneman and Nelson (1981) in discussing community college financing indicated that "equitable distribution of educational opportunities" was better served by student equity than taxpayer equity (p. 122), and further proposed that states should "reduce the disparity in local resources available per (community college) student" (p. 125). Garms (1977) listed interdistrict equity as one of the criteria for community college funding methodologies. Nelson (1982) in the chapter titled Equity and Higher Education Finance: The Case of Community Colleges said that community colleges were the "sector of higher education with the closest kinship to elementary-secondary schooling" (p. 215). "Revenues per student" and "interdistrict equity at the community college level" was stated to be "quite similar" to the "school finance reform movement" as it relates to "educational opportunity" (Breneman & Nelson, 1981, p. 121). The use of the equity measuring techniques, prevalent in evaluating secondary education per-pupil fiscal equity, was based on the similarities of the K-12 and community college systems and the need to measure the distribution disparity of per-student funding for the purpose of examining the resulting temporal trend in horizontal equity.

In higher education, the question of horizontal equity, the "equal treatment of equals under equal circumstances,"

has been raised relative to the budgeting process for postsecondary education in effect in many states (McKeown, 1986, p. 63). McKeown (1986) stated that

federal courts have been involved in the debate over the use of funding formulas in the equitable distribution of state resources to institutions of higher education. (p. 63)

Wood and Honeyman (1990) indicated that in public school finance, the recent focus has been "on the states' responsibility to provide an appropriate financial mechanism to guarantee the delivery of equitable education programs" (p. 8). Carroll (1982) indicated that 22 states had changed their education finance model but that "no standard model of reform" had emerged (p. 237). Odden (1982) stated that "equity issues have been the targets of most recent school finance reforms passed by states" (p. 312).

Jones (1985) indicated that education finance has focused on two equity concepts, "horizontal equity" and "vertical equity" (p. 56). Jones (1985) defined horizontal equity as "equal treatment of equals" and vertical equity as "unequal treatment of unequals" (p. 56). Wood et al. (1984) stated that "in most state assessments of educational finance programs, horizontal equity analysis is desired as opposed to vertical analysis" (p. 4). Horizontal equity was the basic theory used in this study.

McMahon (1982) stated that "the most practical measure of horizontal equity is the real current expenditure per child" (p. 16). McMahon (1982) further indicated that

current expenditures should exclude "the more erratic capital outlays" (p. 17). In the context of a state's school districts, "fiscal equity would require equal per-pupil revenues." This study used current general fund revenues and revenue sources but excluded revenues for capital expenditures.

Not all writers agreed on the topic of equity. Cohn (1982) claimed too much emphasis was placed on inputs (per-pupil expenditures) and that more emphasis should be placed on optimization of resources usage that combined "efficiency, equity, and 'need'" (p. 290).

Wood et al. (1984) defined the "essence of fiscal equity" by stating that "a student's access to educational revenues should not differ substantially from locality to locality" (p. 5). Most community colleges served local clientele as a large portion of the student enrollment. The Florida master plan called for providing "post-high-school education within commuting distance of more than 99%" of the population of the State of Florida (State of Florida Bureau of Information Systems, 1991, p. 1). Student attendance was not restricted by locality; however, the economic penalty of attending alternative locations could act as an economic constraint due to the additional expenses associated with commuting or residency. Wood et al. (1984) further indicated that fiscal equity can be divided into "Per-Pupil Revenue Disparity" and "Fiscal Effort Neutrality" (p. 5).

The first category per-pupil or per-student revenue disparity, in the community college context, was the focus of this research study.

In summary, equity was found to be a broad and complex theory. Even within education finance the concept was multifaceted and subject to more than one, sometimes conflicting, objective. Horizontal equity was differentiated from equality as not being equivalent terms. Horizontal equity was contrasted in the literature with vertical equity. There was general consensus in the literature concerning the definition of the concept of horizontal equity and the applicability of the concept of horizontal equity to per-student expenditures.

Measurement of Equity

Gurwitz (1982) said that "to determine whether expenditures have or will become more equal and by how much, we need measures of equity" (p. 179). "The measurement of inequality was first conceptually formulated by Pareto" and the basic formula was called Pareto's Law (Jordan & McKeown, 1980, p. 94). It was reported by Jordan and McKeown (1980) that Pareto's Law was extensively used to measure inequalities in wealth distribution.

Alexander (1982) indicated that the "development of quantitative measures of school finance equity was stimulated by Congress in 1974" through legislation that required that the U.S. Commissioner of Education issue

regulations establishing tests for determining if expenditures were equalized (p. 209). A result of the regulations was "an expenditure disparity test" (Alexander, 1982, p. 209). The value, known as the federal range ratio, should not exceed 0.25, the "disparity standard," after cost differential adjustments (Federal Register, 1976, p. 26320).

Tibi (1988) indicated that if resources were distributed in an equitable way for the same type and level of education then "total expenditures will be well explained by a small number of indicators expressing the needs of the institution" (p. 94). Friedman and Wiseman (1980) indicated that three tasks were involved in empirical work on equity. These were identification of inequity, measurement, and prediction (Friedman & Wiseman, 1980).

Historically, equity has been measured using several different indicators or measurements, but the basic concept is to compare distributions. Guthrie et al. (1988) indicated that the measurement of horizontal equity was easier because it is easier to measure equality than inequality. Guthrie et al. (1988) further reported that the reason was that it was more difficult to determine "whether an unequal distribution [was] equitable" (p. 302).

Garms, Guthrie, and Pierce (1978) had indicated that the techniques used to measure equity had advantages and disadvantages; one advantage was the understandability of the results by the lay person. Garms et al. (1978) stated

that the need was to have a recognizable method of evaluating "movement in the direction of equality" and not to "strive for perfect expenditure equality" (p. 179).

In community colleges, as in public schools, the advice that Harrison (1976) gave concerning equity was applicable; he stated that "reliable policy advice requires empirical knowledge of certain key dimensions" (p. 44). Perfect expenditure equality was not recognized as a goal of community colleges. There was a need for a "per-unit-of-activity basis" in examining equity as in examining efficiency (Brinkman & Jones, 1991a, p. 4).

The Per-Pupil Revenue Disparity Criterion used the coefficient of variation, the McLoone index, the federal range ratio, and the Gini index and Lorenz curve per Wood et al. (1984). Additional per-student fiscal equity measures for horizontal equity were described by Berne and Stiefel (1984), Garms et al. (1978), Gurwitz (1982), Guthrie et al. (1988), Harrison (1976), and Jordan and McKeown (1980). Berne and Stiefel (1984) included eleven measures of horizontal equity on a list that did not claim to be "exhaustive," but did claim to be "rather complete" (p. 19).

The selection of the horizontal equity measures was based on the criteria of having a broad range of measures and to select the most utilized or recognized measures. The Per-Pupil Revenue Disparity Criterion for evaluating secondary education funding horizontal equity (Wood et al.,

1984) was used to evaluate the community college per-student funding equity. The four measures represented the general consensus of all sources cited.

The Wood et al. (1984) measures were the coefficient of variation, McLoone index, federal range ratio, Gini coefficient, and the accompanying Lorenz curve. In addition, the range and restricted range were used (Berne & Stiefel, 1984; Gurwitz, 1982; Jordan & McKeown, 1980).

Berne and Stiefel (1984) stated that the six horizontal equity measures--range, restricted range, federal range ratio, McLoone index, coefficient of variation, and the Gini coefficient--"reasonably represent the diversity of value judgements that are incorporated in horizontal-equity measures" (p. 64). The six selected measures were reported by Berne and Stiefel (1984) in their analysis of 32 studies involving horizontal equity measurement to have been the most frequently used horizontal equity measures employed by researchers in the studies that involved equity measurement.

The rationale for using the K-12 education statistical indicators for per-student expenditure equity evaluation was the consistency of mission of the community colleges, the close "kinship" of community colleges and K-12 education (Nelson, 1982, p. 215), the open door approach to enrollment (Breneman & Nelson, 1981), and the "equal treatment of equals" concept of horizontal equity (Berne & Stiefel, 1984, p. 13; Jones, 1985, p. 56; Jordan & McKeown, 1980, p. 102;

Wood et al., 1984, p. 4). Effectively, a state tax supported multiple institution community college system paralleled a multiple school taxing district. Equity within a district and equity within the state community college system were similar.

Community College Funding Methodologies

States have sought the optimal funding method but no generally accepted best method was found in the literature. Criteria for judging methods have been proposed by several researchers including Martorana and Wattenbarger (1978) and Garms (1977). State funding for public community colleges has been categorized into six subcategories of three funding methodologies (Wattenbarger & Starnes, 1986). Wattenbarger and Mercer (1988) categorized three major funding methodologies for community colleges based on the Wattenbarger and Starnes criteria (Starnes, 1975) as follows:

1. Minimum Foundation Funding was described as funding at a variable rate depending on local tax availability, in order to provide a guaranteed minimum level of per-student support.

2. Negotiated Budget Funding was described as state funding that is annually or biannually negotiated with a state legislature or board; no local share. The three negotiation methods currently reported used were (a) cost-

to-continue-plus, (b) formula-plus, and (c) dual system appropriation/allocation.

3. Formula Funding was described as funding based on formulas that specify a stated number of dollars per unit measure. The unit of measure was reported to vary in the individual cases. The three subcategories included (a) unit rate formula funding, (b) formula grant plus funding, and (c) formula cost-based funding.

Formula Budgeting

Budget formulas have been employed by numerous state governments to fund the needs of the state's postsecondary education and to allocate the state's available resources (Honeyman, Williamson, & Wattenbarger, 1991). McKeown (1986) indicated that some form of formula budgeting was used by the majority of states (30 states in 1980) and that the formulas that were used had been based on least-squares regression analysis or a standard cost approach.

According to McKeown (1986), the trend has been for more states to use more complex formulas with better cost data. Brinkman (1984) reported that "roughly half of the states" use a formula for "part of the funding process" (p. 333). Several states used a single formula, but Oregon used the most formulas (twenty-seven). In the period 1988 to 1990 "eight states reported that they have changed to a formula-based allocation scheme" for the state's public community college system (Honeyman et al., 1991, p. 5).

Formula budgeting is the "prevalent approach to allocating state resources to colleges and universities" (Ahumada, 1990, p. 467). McKeown (1986) indicated that a majority of states used funding formulas for higher education resource allocation. For community college funding, Wattenbarger and Mercer (1988) indicated that FTE based formula budgeting has been "popular" (p. 2). From an international perspective, Levacic (1989) reported that in England the 1988 Education Reform Act required the use of formulas for budgeting both schools and colleges.

As previously stated, there was significant concern expressed in the literature for the financial crisis that was facing community colleges. The problem was not new; however, Lombardi (1971) expressed concern for sufficiency of funding for community colleges and Kintzer (1980) was concerned with the effect of Proposition 13 on community colleges. Martorana and Wattenbarger (1978) indicated that community colleges have "experienced increasing financial uncertainty" due to the "pressures on public support to postsecondary education" (p. 386), and Lombardi (1979) indicated that the "lean years" were facing the community colleges in the "post-proposition 13 era." El-Khawas, Carter, and Ottinger (1988) reported that current-fund expenditures per full-time equivalent student (FTE) for 2-year public institutions had increased only "4.8%," in constant dollars, in the period 1970-71 to 1984-85

(p. 34). Augenblick (1978a) reported that community colleges "tend to receive less support per student than other public institutions" (p. 316), and that state appropriations had not "risen as rapidly as the increase in current operating expenditures" (Augenblick, 1978b, p. 1). Leslie and Ramey (1986) reported enrollment elasticity of about 1.5% (appropriations increased 1.5% for a 1.0% enrollment increase).

Gold (1990) indicated that higher education was the "second largest component of state budgets" and as "such a major component of state spending," the "general state fiscal conditions are the most important determinant of state support" (p. 21). Because higher education has been a state funded function, the economic downturns in the United States had impaired the ability of many states to finance postsecondary education.

Sources of Revenue

The sources of revenue for public 2-year colleges were categorized as state and local government; tuition and fees; auxiliary enterprises; federal government; sales; gifts, grants, and contracts; and endowments (Erekson, 1986). The preceding list was in descending order of the magnitude of the contribution, with state and local revenue making the largest contribution, 65.5%, and with endowments contributing less than 0.1% of the total revenue (Erekson, 1986). It was reported by Wattenbarger and Mercer (1988)

that state and local revenue was the largest revenue component for community colleges in fiscal year 1985-86. Honeyman et al. (1991) indicated that for 1988 an average of 58.16% of revenues for community colleges came from the state and an average of 12.93% came from local sources. They further indicated that student fees were the next most significant source of revenue at 21.67%.

The trend in relative contribution of the various components of revenue, for public colleges and universities over the past 50 years, had remained basically constant until the federal government component of revenues began to decrease in the late seventies (Erekson, 1986). The decrease in federal government contribution to revenue has been offset by large increases in state and local government revenue (Erekson, 1986) along with sizable increases in tuition and fees (Wattenbarger & Mercer, 1988).

The relationship of revenues to cost (or expenditures) was summarized in the Revenue Theory of Cost (Bowen, 1980). Bowen (1980) stated that "an institution's educational cost per student unit is determined by the revenues available for educational purposes;" and therefore, "given the enrollment, cost per student unit is directly proportional to these revenues" (p. 17). Bowen (1980) said "there is virtually no limit to the amount of money an institution could spend for seemingly fruitful educational ends" or in pursuit of its goals and that an institution "spends all (the money) it

"raises" (p. 20). Bowen (1980) also indicated that expenditures generally equal resources, and that the differences between the two were generally attributable to gains or losses in reserve funds (retained fund balance). The retained fund balance in a given year was the difference between the beginning and ending fund balance and included adjustments to fund balance. Brinkman and Jones (1991b) reported that increases in fund balance or no change in fund balance with transfers to other funds was considered a "healthy picture" for institutions (p. 53). Minter and Bowen (1980) reported that the "trend of both educational and general expenditures and total expenditures followed closely the trend of revenues indicating that collectively the institutions approximately balanced their budgets" (p. 54).

Erekson (1986) reported that state and local government appropriations were the largest revenue source for public colleges and universities. State appropriations came via legislative action and through local government taxing authority. He further indicated there had been an increased reliance on state appropriations and fees as the principal sources of revenue as the federal government's revenue share had decreased. Fischer (1990) reported "there was great diversity across the states in policies toward financing higher education" (p. 44).

Tuition and fees constituted the second largest revenue component of public 2-year higher education institutions (Erekson, 1986). The appropriate level of contribution by tuition and fees to the cost of higher education and the effect on attendance has been the subject of considerable research (Berne, 1980). The economic studies of the 1960's led to the realization that the traditional production components, labor and capital, left variances that were due to the quality of labor (Leslie & Brinkman, 1988). In separating human capital from labor, one of the differentiating elements is the lack of transferability of education. Schultz's (1982) concept was that people invest in education due to their expectation of a favorable return on investment.

The human capital concept led to studies aimed at quantifying the return on investment associated with education. The studies have looked at both the return on private investment and the return on public investment to determine the appropriate contribution of fees to total revenues (Leslie & Brinkman, 1988). The results obtained by Cohen and Greske using 1979 census data yielded values of \$60,000 and \$329,000 for males using discount rates of 5% and 0% respectively for the pecuniary personal benefit of education. The meta-analysis approach used by Leslie and Brinkman (1988) indicated that the internal rate of return associated with an undergraduate degree was in the 11.8-

13.4% range. The economic research on social rates of return indicated that the investment of public funds has a positive investment return in the 11-12% range (Leslie & Brinkman, 1988).

Tuition and fees continued to rise, Wattenbarger and Mercer (1988) indicated that "each year the amount is increasing and apparently will continue to increase" (p. 2). Honeyman et al. (1991) indicated that fees in 1988 averaged 21.67% of all revenues for public community colleges.

The setting or pricing of tuition and fees has gained in importance due to the substantial contribution fees made to total revenues (Honeyman et al., 1991). Research indicated that tuition impacted students. The meta-analysis of Leslie and Brinkman (1988) indicated that the price sensitivity of 18-24 year age group to a \$100 increase in the cost of education was a 0.7% drop in the enrollment rate for first time students in 1982-1983. Erekson (1986) reported that the percentage contribution to revenues of tuition and fees in public 2-year institutions had increased from 10.7% in 1959-60 to 17.2% in 1981-82.

The federal government, as with public K-12 education, has no constitutional mandate in the area of funding higher education including community colleges. Federal activities and programs have been a result of broad interpretation of areas of the Constitution that are not specifically concerned with education. Historically, the Morrill Acts of

1862 and 1890, the Serviceman's Readjustment Act of 1944, NDEA in 1958, and the Higher Education Act of 1965 have been significant federal legislation aimed directly at higher education. The current thrust of federal higher education involvement was set in motion by the Education Amendments of 1972.

Student needs and equal opportunity have been the two main areas of federal involvement as a result of the legislation and have been the basis for considerable litigation (Camp, Thompson, & Crain, 1990; Vacca, 1975; van Geel, 1991). The "New Federalism" approach has resulted in significant reductions in the federal government's revenue contribution to colleges and universities. The federal contribution has decreased from its historical 15% level to the 7% level of recent years. Based on 1988 data, the federal contribution to community colleges averaged only 2.7% (Honeyman et al., 1991).

The State of Florida Community College Division divided revenues into two fund categories. The categories were Education and General Current Fund Revenues and Education and General Restricted Fund Revenues (State of Florida Bureau of Information Systems, 1991). For the 1989-90 fiscal year, the total General Current Fund revenues were reported as \$742,529,748 and the Restricted Current Fund revenues were reported as \$56,075,486 (State of Florida Bureau of Information Systems, 1991). The Current General

Fund revenues were further categorized as State Community College Program Funding (CCPF), State Other, Local Student Fees, Local Other, and Federal Government (State of Florida Bureau of Information Systems, 1991). State CCPF was the largest category and constituted 64.3% of total current fund revenues. Student fees was the second largest category at 21.8% of total current fund revenues. All other categories constituted 13.9% of the total current fund revenues (State of Florida Bureau of Information Systems, 1991, p. 47).

It was found that the sum of the other categories had remained relatively consistent in the 4.3% to 8.0% range from 1980-81 through 1987-88 and then increased to 9.7% in 1988-89 and 13.9% in 1989-90 (State of Florida Department of Education Division of Community Colleges, 1982, 1983, 1984, 1985, 1986, 1987; State of Florida Bureau of Information Systems, 1988, 1989, 1990, 1991). The education enhancement revenues from the Florida Lottery were included in the state other category beginning in the 1987-88 fiscal year per a report titled "Florida System of Community Colleges, 1991 Legislative Session, Significant Actions Affecting Policy." The Current Fund Educational and General expenditures came from the Educational and General Current Fund revenue sources.

The Florida Funding Methodology

The basic foundation funding source for the State of Florida community colleges was the State Community College

Program Fund and was promulgated in the Florida Statutes §240.347 (1989) as follows:

(1) There is established a State Community College Program Fund. This fund shall compromise all appropriations made by the legislature for the support of the current operating program and shall be apportioned and distributed to the community college districts of the state on the basis of procedures established by law and regulations of the State Board of Education and the State Board of Community Colleges. (p. 1797)

The second major source of revenues available to the community colleges was student fees. The current basis for establishing student fees was in the Florida Statutes §240.35 (1990), titled Student Fees. The legislation stated that the "State Board of Community Colleges shall establish the matriculation and tuition fees" (Florida Statutes §340.35, 1990, p. 566).

The basis for variability in per-student revenues was found in the various sections of Florida Statutes §240.35 (1989). In Florida Statutes §240.35 (5) (1989) the legislation established that community college boards of trustees could establish fees that varied as much as 10% from the applicable State Board of Community Colleges average fees, and that out-of-state student fees must have been at least twice the amount of state resident fees. In Florida Statutes §240.35 (6) (1989) an optional 10% activity and service fee was allowed and Florida Statutes §240.35 (7)(a) (1989) provided authority for collection by the community colleges an amount of up to 5% for financial aid

purposes. Also contributing to the variability of fees was Florida Statutes §240.35 (8) (1989) that set conditions for waiving fees and Florida Statutes §240.35 (11) (1989) that allowed collection of a fee not to exceed \$1.00 for capital improvements.

The Florida Community College Program Fund (CCPF) is described in Appendix C. Briefly, the funding process consisted of determining base year expenditures and applying incremental changes. Increases or decreases in funding for FTE changes were constrained by a 5% corridor above or below the current year FTE funding level. The funding corridor approach required a change of more than 5% in the funded FTE level in order to obtain budget modification. Facility increases were budgeted on a square footage basis. The CCPF was the largest component of revenue for the community colleges and constituted approximately 65% of total revenues (State of Florida Bureau of Information Systems, 1991).

Summary

There was substantial reference in the literature, both directly and indirectly, to the concept of equity in education finance. Numerous contributors to education finance literature had addressed the issue. The concept of horizontal equity was viewed more consistently in the literature than any other aspect of equity. There was found in the literature a well established consensus concerning the appropriate measurement techniques and indicators of

horizontal equity. The various equity indicators were more sensitive to detecting certain aspects of horizontal equity than other aspects of horizontal equity. The six measures most widely supported in the literature represented a broad indication of the various aspects of horizontal equity. The six measures: range, restricted range, federal range ratio, coefficient of variation, McLoone index, and Gini coefficient were supported as appropriate by the majority of sources and by the research of Berne and Stiefel (1984) as having been the most widely used measures of horizontal equity in the education finance context.

The goal of equity in community college financing was widely supported; however, studies pertaining to the measurement or evaluation of equity in community colleges were not prevalent in the literature. The use of per-student current revenues for community colleges for measuring horizontal equity was based on extending the use of per-pupil current revenue horizontal equity measurement techniques found in the K-12 environment. The use of the K-12 horizontal equity measurement techniques for multiple institution public community college system could also be established due to the similarities of the systems and the equity goals of community colleges.

CHAPTER THREE
RESEARCH METHODOLOGY

Introduction

The purpose of this study was to extend the discussion of horizontal fiscal equity as it relates to public K-12 education to the multiple institution public community college system by analyzing selected horizontal equity measures and examining the temporal trend of the horizontal equity over a 10-year period. This study was focused on per-student total revenues that resulted from the distribution of the major current general fund revenue sources (state foundation funding formula, student fees, and other revenue) in the multiple institution public community college system of the State of Florida.

In this study were employed the measurement methods that were normally used in public K-12 horizontal equity evaluation. The methodology was applied to public community college per-student revenues and revenue sources for the purpose of evaluating the temporal trend in horizontal equity for the multiple institution public community college system over a 10-year period.

The study included the application of the six most frequently used horizontal equity measures (Berne & Stiefel,

1984) and evaluation criteria that would permit community college per-student horizontal equity to be examined and analyzed. In addition, this research study included examining the trends in the horizontal equity measures over the 10-year period utilized by this study and analyzing the contribution the various revenue components had on the horizontal equity of the demonstration community college system. The research methodology was nonexperimental in design and utilized population data for the demonstration state for the 10 fiscal year periods from 1980-81 to 1989-90.

The objective of this study was to provide an examination of the selected state community college system per-student fiscal equity, as measured by the horizontal equity measurement criteria used for K-12 public education per-pupil equity, and an analyses of the trend of the equity during the 10-year period utilized in this study. This research was focused on a state that had a consistent mission for the institutions within the state community college system and no stated objective of differentiating institutions by funding level. Florida was selected as the demonstration state. Florida was selected because it was a large representative state community college system that consisted of 28 institutions with a common mission statement (State of Florida Bureau of Information Systems, 1991). In

addition, these data for the population of this study were consistent for the 10-year period of the study.

A 1991 draft recommendation by the Florida Division of Community Colleges listed "equalization of the base" as one of the objectives of a proposed funding method change for the 1991-92 fiscal year. Other funding concerns expressed in the 1991 draft by the Florida Division of Community Colleges included district cost differentials and "small college adjustments."

The Per-Pupil Revenue Disparity Criterion for evaluating secondary education funding horizontal equity (Wood et al., 1984) were used to analyze the community college per-student funding equity. The Wood et al. (1984) measures were the coefficient of variation, McLoone index, federal range ratio, Gini coefficient, and the accompanying Lorenz curve. In addition, the range and restricted range were used in the analysis of the total revenues (Berne & Stiefel, 1984; Gurwitz, 1982; Jordan & McKeown, 1980). Berne and Stiefel (1984) stated that the six horizontal equity measures--range, restricted range, federal range ratio, McLoone index, coefficient of variation, and the Gini coefficient--"reasonably represent the diversity of value judgements that are incorporated in horizontal-equity measures" (p. 64). The rationale for using the secondary education statistical indicators for per-student expenditure equity evaluation was the consistency of mission of the

community colleges, similarities of the K-12 and community college systems, the open door approach to enrollment, and the concept of horizontal equity (Jones, 1985). Based on the concept of horizontal equity, the funding provided by the state and the other revenues that were available for funding the education of the students of the community college system should not be dependent on the institution attended by the students.

The purpose of this chapter is to describe the research methodology that was used to examine the temporal trend in per-student revenues and sources of revenues for the multiple institution public community college system of the State of Florida.

Population of the Study

The population of this study consisted of all institutions of a state that reported to have a consistent mission objective and consistent funding objective for the institutions within the state system of community colleges. The State of Florida Community College System was selected because it met the criteria and because these data were consistent for the 10-year period utilized by this investigation.

The State of Florida Community College system consisted of 28 institutions with a common mission and method of funding the institutions throughout the 10-year period of this study (Florida Statutes §240.3031, 1991). The number

of institutions in the system remained constant over the 10-year period of this study and had remained constant since 1972 (State of Florida Bureau of Information Systems, 1991).

Enrollment (FTE), expenditure, revenue, and revenues by source data were taken from the Report for Florida Community Colleges (State of Florida Department of Education Division of Community Colleges, 1979, 1980, 1981, 1982, 1983, 1984), Report for Florida Community Colleges, Part 1 (State of Florida Department of Education Division of Community Colleges, 1985), Report for Florida Community Colleges, The Fact Book (State of Florida Department of Education Division of Community Colleges, 1985, 1986, 1987) and the Report for Florida Community Colleges, The Fact Book (State of Florida Bureau of Information Systems, 1988, 1989, 1990, 1991). The raw data for FTE, expenditures, and revenues by source are listed in Appendix A.

There was an assumption made in this study by the researcher based on the observation by Bowen (1980) that educational institutions have spent all funding that was available in pursuit of the educational mission. The assumption was that revenues closely approximated expenditures on an institutional level. The assumption was substantiated for the State of Florida Community Colleges by comparing revenues, expenditures, beginning fund balance, and ending fund balance for the period covered by this study (see Appendix D). In addition, the resulting horizontal

equity values for per-student total expenditures and per-student total revenues were compared (see Appendix D).

Based on this assumption, the effect of revenue and revenue sources on per-student expenditure horizontal equity could be interpreted based on the resulting per-student revenue horizontal equity. Revenue horizontal equity and expenditure horizontal equity were considered synonymous and due to the fungible nature of the revenue sources the components of revenues were considered to have been components of expenditures. Student and full time equivalent (FTE) student annualized are used interchangeably in this study; therefore, per-student and per-FTE were treated as equivalent terms for the purpose of this study.

Methodology: Horizontal Fiscal Equity Measurement

This part of the study design was used to determine if the community college per-student revenues for the selected population were equitable based on the per-pupil funding disparity criteria for horizontal equity as described by Wood et al. (1984), and additional measures of horizontal per-student equity as indicated by Berne and Stiefel (1984), Gurwitz (1982), and Jordan and McKeown (1980).

The following statistical measurement indexes for equity were used in this study: range, restricted range, federal range ratio, coefficient of variation, McLoone index, Gini coefficient and Lorenz curve. The equity measures were calculated for each institution for each year

of this study. The six selected measures were reported by Berne and Stiefel (1984) in their analysis of 32 studies involving horizontal equity measurement to have been the most frequently used horizontal equity measures employed by researchers in the studies that involved equity measurement. A discussion of each horizontal equity measurement indicator follows by subheading.

Range

The range was the mathematical difference between the highest and lowest observation, in this study the observation was the institution's per-student revenue (Berne & Stiefel, 1984; Gurwitz, 1982). The range was determined by ranking the per-student revenues of each institution and subtracting the highest value from the lowest value. As the range decreases, the equity increases. The range was a "complete measure in that the equality of any two distributions can be compared" (Gurwitz, 1982, p. 182); however, the range was not considered to have been the best indicator of equity because it considered only the extremes of the distribution. The range was calculated for each year of this study. The formula used was as follows:

$$\text{Range} = \text{Highest } X_i - \text{Lowest } X_i$$

where X_i was the per-student expenses or revenues for institution (i).

Restricted Range

The restricted range was the difference between the 95th and 5th percentile values (Berne & Stiefel, 1984). For the 28 institutions in the Florida Community College System, the per-student revenues of the institution for the corresponding 95th and 5th percentile student when ranked in per-student revenue order was selected. The restricted range was considered a better indicator of horizontal equity because of the exclusion of the extremes of the distribution. The formula used for the restricted range was as follows:

$$\text{Restricted Range} = X_{95\text{th}} - X_{5\text{th}}$$

where $X_{95\text{th}}$ was the 95th percentile student's corresponding per-student revenue or expense and

$X_{5\text{th}}$ was the 5th percentile student's corresponding per-student revenue or expense.

Federal Range Ratio

The federal range ratio was the 95th percentile range value minus the 5th percentile range value divided by the 5th percentile range value (Berne & Stiefel, 1984). The federal range ratio is restricted range, as previously described, divided by the 5th percentile student's corresponding per-student revenue. The closer the ratio is to 0.0, the more equitable the distribution of per-student

revenues. A federal range ratio not exceeding 0.25 was considered an equitable distribution (Federal Register, 1976). The formula used for the federal range ratio was as follows:

$$\text{federal range ratio} = X_{95\text{th}} - X_{5\text{th}} / X_{5\text{th}}$$

where $X_{95\text{th}}$ was the 95th percentile student's corresponding per-student revenues or expenses and $X_{5\text{th}}$ was the 5th percentile student's corresponding per-student revenues or expenses.

Coefficient of Variation

The coefficient of variation was the "square root of the variance divided by the mean" (Berne & Stiefel, 1984, p. 56). A decreasing coefficient of variation indicates increased equity. In the horizontal equity context, the coefficient of variation was the standard deviation of the per-student revenues of the institutions divided by the mean and expressed as a percentage. On a per-pupil basis, "as the coefficient of variation approaches zero, equity becomes greater" (Wood et al., 1984, p. 6). The formula used for the coefficient of variation was as follows:

$$\{[\sum_i P_i (\mu - X_i)^2 / \sum_i P_i]^{.5} / \mu\} * 100$$

where Σ_i was the summation of all institutions (i) from $i=1$ to $i=N$,

N equaled the number of institutions in the system,

P_i was the student FTE for institution (i),

μ was the population mean per-student expense or revenue value, and

X_i was the per-student expense or revenue for institution (i).

McLoone Index

The McLoone index was the ratio of the sum of all students' corresponding revenues below the mean to the equivalent mean student revenues summed for all students below the mean (Berne & Stiefel, 1984). The McLoone index was an indicator of the disparity in the lower half of the distribution. The "closer a McLoone Index is to 1, the greater the equity for the bottom half of the distribution" (Wood et al., 1984, p. 7). The formula used for the McLoone index was as follows:

$$\Sigma_{i,MV} P_i X_i / \Sigma_{i,MV} P_i \mu$$

where MV equaled the mean student's corresponding institution, per-student revenues or expense,

$\Sigma_{i,MV}$ was the summation of all institutions (i)

from i=1 to i=MV,

P_i was the student FTE for institution (i) through the mean value student for the system,

μ was the population mean per-student expense or revenue value, and

X_i was the per-student expense or revenue for institution (i).

Gini Coefficient

The Gini coefficient was the measure of the portion of resources available to the corresponding portion of the population (Berne & Stiefel, 1984). The smaller the value was, the greater the equity. The Gini coefficient was "sensitive to transfers affecting the middle of the distribution" (Jordan & McKeown, 1980, p. 96). A Gini coefficient of zero would indicate perfect equity. The Gini coefficient "indicates how far the distribution of revenues is from providing each proportion of students with equal proportions of revenues." Equity increased as the index approached zero (Wood et al., 1984). The formula used for the Gini coefficient was as follows:

$$(\sum_i \sum_j P_i P_j |X_i - X_j|) / 2 (\sum_i P_i)^2 * \mu$$

where $\sum_i \sum_j$ was the summation of all institutions (i), (j) from i=1 to i=N and from j=1 to j=N, N equaled the number of institutions in the system,

P_i was the student FTE for institution (i),

P_i was the student FTE for institution (j),

μ was the population mean per-student expense or revenues value,

X_i was the per-student expense or revenues for institution (i), and

X_j was the per-student expense or revenues for institution (j).

Lorenz Curve

The Lorenz curve was used to provide a graphical representation of the Gini coefficient. The 45 degree line represented perfect equity. The perfect equity line depicted the percentage of students equal to the percentage of revenues at any point on the line. The curves plotted along with the equity line represented the actual distribution of resources for a given percentage of students. The Gini coefficient was the area between the two curves divided by the area under both of the curves (Berne & Stiefel, 1984). The less area between the two curves or the closer the two curves were to being collinear; the greater the equity. Effectively, if the two curves were collinear the area between the two lines would become zero and represent "perfect equity" (Gurwitz, 1982, p. 186).

Methodology: Equity Trend

This part of the study design was concerned with measuring trends in the horizontal equity for the 10-year period for the population. "Trend analyses in nonexperimental designs are always possible whenever an X variable represents a quantitative dimension of some sort" (Keppel & Zedeck, 1989, p. 515). A "time series can be viewed as the representation of the outcomes of a random variable of concern over a fixed period of time, usually

taken at equally spaced intervals" (Hiller & Lieberman, 1986, p. 680). McClave and Benson (1985) stated that index values were often used as time series data. The equity measurements obtained from part one of this study constituted a quantitative dimension (e.g., McLoone index) over a period of time (1978-79 through 1988-89) and, therefore, met the criteria for time series analysis (Keppel & Zedeck, 1989; McClave & Benson, 1985).

Time series data could be subjected to both descriptive and inferential analyses (McClave & Benson, 1985). Time series analysis required the introduction of a "simple index number" that was based on a change over time (McClave & Benson, 1985, p. 593). In this study, the change over time was the fiscal year reporting periods of the community college system. The quantitative independent variables were considered to be evenly spaced even though slight variations in school year, fiscal year, and calendar year corrections were present during the 10-year period of this study. There were also an equal number of observations in all cases. The number of community colleges remained constant at 28 institutions for the 10-year period of the study, and indexes were calculated for each year.

The equity measurements were evaluated using regression techniques, where the dependent variable y (equity measurement of interest) was used with the independent variable t (the fiscal year period corresponding to the

measurement) to determine "the best fitting line" (Mendenhall, 1971, p. 265). The model for the evaluation was as follows:

$$y = b_0 + b_1 t$$

where y was the equity measurements of interest,

b_0 was the y intercept,

b_1 was the slope of the line, and

t was the period that corresponded to the

measurement (McClave & Benson, 1985).

The algebraic sign of b_1 , the slope of the linear relationship of the time series, was used to analyze the direction of the trend in equity over the 10-year period of this study. For equity measures where smaller is more equitable, the case for all six equity measures utilized in the study except the McLoone index, a negative sign indicated an improved equity trend and a positive sign indicated decreased equity trend. The opposite sign convention was employed for the McLoone index.

Research Design: Total Revenue Equity Trend

The first research question: was there a trend in per-student horizontal fiscal equity, based on per-student total revenues, for the state's public community college system for the fiscal year periods 1980-81 through 1989-90 based on the K-12 public education per-pupil fiscal equity measurement criteria for horizontal equity, required calculation of the per-student revenues for each of the 28

institutions for each fiscal year of the 10-year period utilized in this study. Per-student inputs were based on annual full-time equivalent students or FTE that was determined by dividing credit hours by 40. These FTE data were taken from the Report for Florida Community Colleges (State of Florida Department of Education Division of Community Colleges, 1979, 1980, 1981, 1982, 1983, 1984), Report for Florida Community Colleges, Part 1 (State of Florida Department of Education Division of Community Colleges, 1985), Report for Florida Community Colleges, The Fact Book (State of Florida Department of Education Division of Community Colleges, 1985, 1986, 1987) and the Report for Florida Community Colleges, The Fact Book (State of Florida Bureau of Information Systems, 1988, 1989, 1990, 1991). These raw data for FTE are listed in Appendix A, Table A-1.

The revenues were based on the General Current Fund Revenues for each institution for each year as reported in the same sources used for FTE data. These sources are listed previously for the FTE data. These raw data for total revenues are listed in Appendix A, Table A-3.

These data were used to calculate per-student (per-FTE) revenues by institution by year. The per-student revenues that were calculated were used in the calculation of the six horizontal equity measures: range, restricted range, federal range ratio, coefficient of variation, McLoone

index, and Gini coefficient. The Lorenz curve was also produced.

The resulting equity measures for the 10-year period were subjected to time series analysis using linear regression. The slope of the linear relationship was used to evaluate the trend. The results were interpreted and the discussion of that analysis is contained in Chapter Four.

Research Design: Revenue Sources Equity Trend

The second research question: was there a trend in per-student horizontal fiscal equity for the three major components of revenues, (i.e., the foundation funding provided by the state; student fees; and other sources) for the 10 fiscal year period based on the K-12 public education horizontal fiscal equity measurement criteria, required calculating the per-student (per-FTE) revenues by major source (CCPF, student fees, and other) for each institution for each year of this study. These revenue source data were taken from the Report for Florida Community Colleges (State of Florida Department of Education Division of Community Colleges, 1979, 1980, 1981, 1982, 1983, 1984), Report for Florida Community Colleges, Part 1 (State of Florida Department of Education Division of Community Colleges, 1985), Report for Florida Community Colleges, The Fact Book (State of Florida Department of Education Division of Community Colleges, 1985, 1986, 1987) and the Report for Florida Community Colleges, The Fact Book (State of Florida

Bureau of Information Systems, 1988, 1989, 1990, 1991). These raw data are listed in Appendix A, Table A-4 for CCPF, Table A-5 for student fees, Table A-6 for state other revenues, Table A-7 for local other revenues, and Table A-8 for federal revenues.

The General Current Fund Revenues for each institution for each year were used. These revenue data came from the same sources that were used for total revenues and FTE data. The state other revenue, local other revenue, and federal revenue were combined into one category called other revenue for this study because the contribution of each of these revenue components to the total revenue was relatively small compared to the two primary sources, CCPF and student fees (see Table C-1).

These data were used to calculate per-student (per-FTE) revenues for each of the three major revenue sources, (CCPF, student fees, and other), by institution by year. The per-student revenues were used to calculate the four horizontal equity measures: federal range ratio, coefficient of variation, McLoone index, and Gini coefficient.

Linear regression was used to examine and analyze the linear relationship of the revenue source equity indicators over the 10-year period of this study. The slope of the linear relationship was used to evaluate the trend of the equity measures.

The second part of question two: what was the contribution of the three major components of revenue to the total per-student horizontal fiscal equity, used time series linear regression analysis to examine and analyze the relative contribution of the three revenue components to the resulting per-student revenue equity for each of the four equity measurement indicators. The slope of the linear regression lines of the major sources of revenues and the relationship of the regression lines to the total revenues regression line was used to evaluate the relative contribution of the sources. The algebraic sign of the slope of the linear relationship of the time series was used to analyze the trend in the equity measures during the 10-year period of this study. The results were interpreted and the discussion of that analysis is contained in Chapter Four.

Summary

Chapter Three contains the description of the equity measures, statistical techniques, and the study design methodology used to investigate the two research questions. The six horizontal equity measures that were used in this study, were described along with the basis for interpreting the horizontal fiscal equity represented by the measures. The methodology used to examine the temporal trend of the equity measures, time series linear regression, was described along with the basis for interpreting the results.

CHAPTER FOUR
ANALYSIS OF DATA

Introduction

The purpose of this study was to extend the discussion of horizontal fiscal equity as it relates to public K-12 education to the multiple institution public community college system by examining selected horizontal equity measures and analyzing the temporal trend of the horizontal equity over a 10-year period. The horizontal fiscal equity was based on per-student revenues, that resulted from the distribution of the major sources of revenues (state funding formula, student fees, and other revenue). The horizontal equity measurement methodology used in public K-12 horizontal equity studies was applied to public community college per-student revenues and revenue sources. The research methodology was nonexperimental, used population data for the 28 community colleges of the State of Florida (see Table B-1), and utilized the 10 fiscal year period from 1980-81 to 1989-90. The Per-Pupil Revenue Disparity Criterion for evaluating secondary education funding horizontal equity (Wood et al., 1984) were used with the addition of the range and restricted range (Berne & Stiefel, 1984; Gurwitz, 1982; Jordan & McKeown, 1980). The six horizontal equity measures (range, restricted range, federal

range ratio, McLoone index, coefficient of variation, and the Gini coefficient) were used because the six measures "reasonably represent the diversity of value judgements that are incorporated in horizontal-equity measures" (Berne & Stiefel, 1984, p. 64).

The purpose of this chapter is to present the results of the study based on the analysis of these data. There were two research questions and the results are presented for each question under the headings total revenue equity for question one and revenue source equity for question two.

Total Revenue Equity

The findings of the first research question--was there a trend in per-student horizontal fiscal equity, based on per-student total revenues, for the state's public community college system for the fiscal year periods 1980-81 through 1989-90 based on the K-12 public education per-pupil fiscal equity measurement criteria for horizontal equity--are presented by horizontal equity measure. The raw data for FTE and total revenues are listed in Appendix A, Tables A-1 and A-3. The results are presented by equity measure.

Gini Coefficient

The Gini coefficient was the measure of the portion of revenues available to the corresponding portion of the students. The smaller the value was, the greater the equity. The Gini coefficient was "sensitive to transfers affecting the middle of the distribution" (Jordan & McKeown,

1980, p. 96). A Gini coefficient of zero would indicate perfect equity. The Gini coefficient "indicates how far the distribution of revenues is from providing each proportion of students with equal proportions of revenues." The least equity was found in fiscal year 1980-1981 (FY 1980-81) at 0.0902 and the highest level of equity was found in FY 1986-87 at 0.0406 (see Table 4-1).

Table 4-1

Gini Coefficient for Per-Student Total Revenues

FISCAL YEAR	GINI COEFFICIENT
1980-1981	0.0902
1981-1982	0.0723
1982-1983	0.0614
1983-1984	0.0510
1984-1985	0.0464
1985-1986	0.0547
1986-1987	0.0406
1987-1988	0.0463
1988-1989	0.0534
1989-1990	0.0547

The slope of the time series using the Gini coefficients for the 10-year period was negative, -0.00333, and the standard error of the coefficient was 0.00122 (see Table 4-2). The negative slope indicated a trend toward increased equity during the 10-year period because the Gini coefficient was approaching zero. Equity increases as the index approaches zero (Wood et al., 1984).

Table 4-2

Gini Coefficient Regression Output for Per-Student Total Revenues

Regression Output:	
Constant	0.075445231968
Std Err of Y Est	0.011150584837
R Squared	0.479536910435
No. of Observations	10
Degrees of Freedom	8
X Coefficient(s)	-0.00333297241
Std Err of Coef.	0.001227638987

Coefficient of Variation

The coefficient of variation was the standard deviation of the per-student revenues of the institutions divided by the mean and expressed as a percentage. A decreasing coefficient of variation indicates increasing equity. As the coefficient of variation approaches 0.0, the equity increases. The largest coefficient of variation (lowest equity), 0.1545, occurred in FY 80-81 and the least (highest level of equity), 0.0937, occurred in FY 1987-88 (see Table 4-3).

The slope of the time series linear regression of the coefficient of variation for the 10-year period was negative indicating an increasing equity trend. The slope of the time series linear regression was -0.00522 and the standard error of the coefficient was 0.00151 (see Table 4-4).

Table 4-3

Coefficient of Variation for Per-Student Total Revenues

FISCAL YEAR	COEFFICIENT OF VARIATION
1980-1981	0.1545
1981-1982	0.1345
1982-1983	0.1109
1983-1984	0.1055
1984-1985	0.1001
1985-1986	0.1142
1986-1987	0.0855
1987-1988	0.0937
1988-1989	0.1026
1989-1990	0.0981

Note: The coefficient of variation is listed in the table as the decimal equivalent of the percentage.

Table 4-4

Coefficient of Variation Regression Output for Per-Student Total Revenues

Regression Output:	
Constant	0.138682919298
Std Err of Y Est	0.013794418168
R Squared	0.596455683298
No. of Observations	10
Degrees of Freedom	8
X Coefficient(s)	-0.00522233683
Std Err of Coef.	0.001518715456

McLoone Index

The McLoone index was the ratio of the sum of the actual revenues for students below the mean to the equivalent mean value summed for all students below the mean. In evaluating the McLoone index, the closer the index

was to 1.0, the greater the equity. The McLoone index was an indicator of the disparity in the lower half of the distribution. The highest level of equity was found in FY 1983-84 at 0.942, which was only 0.002 more than the FY 1986-87 McLoone index of 0.940 (see Table 4-5). The lowest level of equity was found in FY 1980-81 with an index of 0.878.

Table 4-5

McLoone Index for Per-Student Total Revenues

FISCAL YEAR	MCLOONE INDEX
1980-1981	0.8782
1981-1982	0.8976
1982-1983	0.9268
1983-1984	0.9418
1984-1985	0.9395
1985-1986	0.9221
1986-1987	0.9396
1987-1988	0.9258
1988-1989	0.9182
1989-1990	0.9144

The slope of the time series linear regression was positive, 0.00267. Based on the intercept value and the positive slope, the McLoone index trend line is approaching the 1.0 index value. The McLoone index approaching 1.0 would indicate increasing equity; however, it should be noted that the standard error of the coefficient, 0.00213 was almost as large as the slope coefficient (see Table 4-6). This indicates that the improvement could be small.

Table 4-6

McLoone Index Regression Output for Per-Student Total Revenues

Regression Output:	
Constant	0.905707503817
Std Err of Y Est	0.019410192598
R Squared	0.163378026618
No. of Observations	10
Degrees of Freedom	8
X Coefficient(s)	0.002671037919
Std Err of Coef.	0.002136991872

Federal Range Ratio

The federal range ratio was the 95th percentile range value minus the 5th percentile range value divided by the 5th percentile range value (Berne & Stiefel, 1984). The closer the ratio was to 0.0 the greater was the equity. The federal range ratio guideline for K-12 equity is a maximum of "0.25" (Federal Register, 1976, p. 26320). The federal range ratios are listed in Table 4-7.

The maximum value, 0.477, indicating the least equity, occurred in FY 1985-86, and the minimum value, 0.239, indicating the highest equity during the 10 years occurred in FY 1983-84. Only the FY 1983-84 federal range ratio, 0.239, was within the federal minimum guideline of 0.250 for horizontal equity.

The slope of the time series linear regression was negative, -0.00753, indicating increasing equity; however, the standard error of the coefficient exceeded the magnitude of the slope indicating that both neutral and positive

slopes were within the confidence interval of the estimate of the slope (see Table 4-8). The equity trend was, therefore, inconclusive.

Table 4-7

Federal Range Ratio for Per-Student Total Revenues

FISCAL YEAR	FEDERAL RANGE RATIO
1980-1981	0.4302
1981-1982	0.4689
1982-1983	0.2826
1983-1984	0.2388
1984-1985	0.4379
1985-1986	0.4772
1986-1987	0.3085
1987-1988	0.3729
1988-1989	0.3534
1989-1990	0.3041

Table 4-8

Federal Range Ratio Regression Output for Per-Student Total Revenues

Regression Output:	
Constant	0.40889596974
Std Err of Y Est	0.08516546476
R Squared	0.074679571322
No. of Observations	10
Degrees of Freedom	8
X Coefficient(s)	-0.00753418661
Std Err of Coef.	0.009376409074

Restricted Range

The per-student revenues of the institution corresponding to the 95th and 5th percentile student when

ranked in per-student revenue order were selected. The 5th percentile per-student revenue was subtracted from the 95th percentile per-student revenue. The results of the calculation is in Table 4-9. The restricted range had a

Table 4-9

Restricted Range for Per-Student Total Revenues

FISCAL YEAR	RESTRICTED RANGE
1980-1981	938.4
1981-1982	1135.5
1982-1983	697.1
1983-1984	685.8
1984-1985	1284.7
1985-1986	1313.8
1986-1987	973.1
1987-1988	1185.1
1988-1989	1234.8
1989-1990	1125.9

minimum value of \$685.8 in FY 1983-84 and a maximum value of \$1313.8 in FY 1985-86. The restricted range values were considerably less than the corresponding minimum and maximum range values. The restricted range values were 38.8% and 37.9% of the respective range values. The slope of the restricted range time series linear regression was 34.62. The slope was positive and was indicative of a decreasing horizontal equity trend (see Table 4-10).

Table 4-10

Restricted Range Regression Output for Per-Student Total Revenues

Regression Output:	
Constant	866.9810913151
Std Err of Y Est	213.9565385643
R Squared	0.21265787452
No. of Observations	10
Degrees of Freedom	8
X Coefficient(s)	34.62601977132
Std Err of Coef.	23.55583962711

Range

The range was the mathematical difference between the highest and lowest per-student revenues in the system. The per-student revenue range for each of the 10 years is listed in Table 4-11.

Table 4-11

Range for Per-Student Total Revenues

FISCAL YEAR	RANGE
1980-1981	2289.3
1981-1982	2634.9
1982-1983	1767.2
1983-1984	2243.1
1984-1985	2485.8
1985-1986	2923.2
1986-1987	3030.9
1987-1988	2970.0
1988-1989	3466.5
1989-1990	2408.0

As the range increased, the equity decreased; however, the range was not considered to have been the best indicator

of equity because the range considers only the extremes of the distribution. The range can be affected by the overall increases in total funding. A pronounced increase (62.5%) was found in the funding per student over the 10-year period. The funding increased from an average of \$2685 per student in 1981-82 to \$4356 in 1989-90. The minimum per-student revenue range, \$1767.2, occurred in FY 82-83 and the maximum range, \$3466.5, occurred in FY 1988-89. The slope of the time series linear regression for the range was positive, 95.17, indicating a decreasing equity trend (see Table 4-12).

Table 4-12

Range Regression Output for Per-Student Total Revenues

Regression Output:	
Constant	2098.399542665
Std Err of Y Est	417.4925419167
R Squared	0.34894271057
No. of Observations	10
Degrees of Freedom	8
X Coefficient(s)	95.17748028414
Std Err of Coef.	45.96441608608

Lorenz Curve

The Lorenz curves were used to provide a graphical representation of the Gini coefficient. The 45 degree (actually the diagonal) line represents perfect equity. The perfect equity line depicts the percentage of students equal to the percentage of revenues at any point on the line. The

Lorenz curves for the highest equity, FY 1986-87, lowest equity, FY 1980-81, and the last year in the study period, FY 1989-90 are plotted in Figures 4-1, 4-2, and 4-3 respectively. The curves represent the actual distribution of resources for a given percentage of students. The Gini coefficient was the area between the two curves divided by the area under both curves (Berne & Stiefel, 1984). The less area between the two curves or the closer the two curves were to being collinear; the greater the equity.

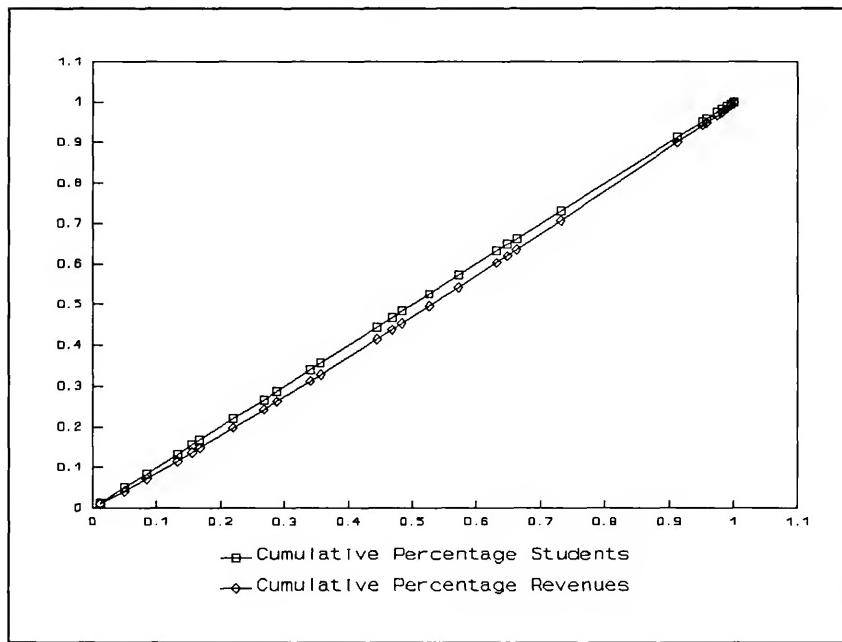


Figure 4-1. Lorenz curve for total per-student revenues for fiscal year 1986-1987.

Figure 4-1 depicts the best Gini coefficient of all years in this study. The area between the two lines is the

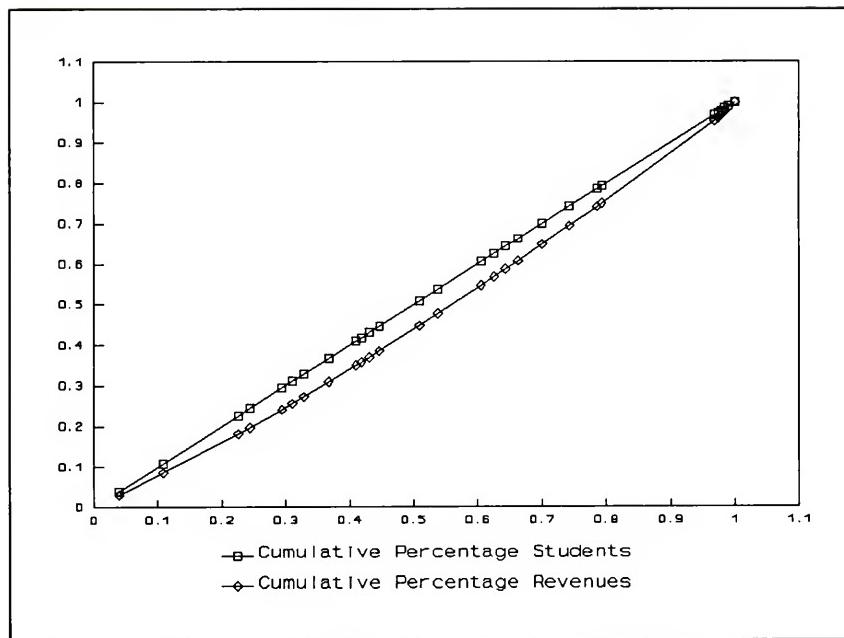


Figure 4-2. Lorenz curve for total per-student revenues for fiscal year 1980-1981.

minimum area of all cases in the study and represents the highest horizontal equity. The Gini coefficient was 0.0406 for fiscal year 1986-87. The Lorenz curve in Figure 4-2 depicts the worst equity case for any year of this study based on the Gini coefficient. The Lorenz curve for this case has the largest area between the curves. The Gini coefficient was 0.0902 for this case, FY 1980-81.

The Lorenz curve in Figure 4-3 is for the last year of the study and represents a Gini coefficient of 0.0547. The area between the curves is between the two extreme cases and has the same basic shape as the two other Lorenz curves.

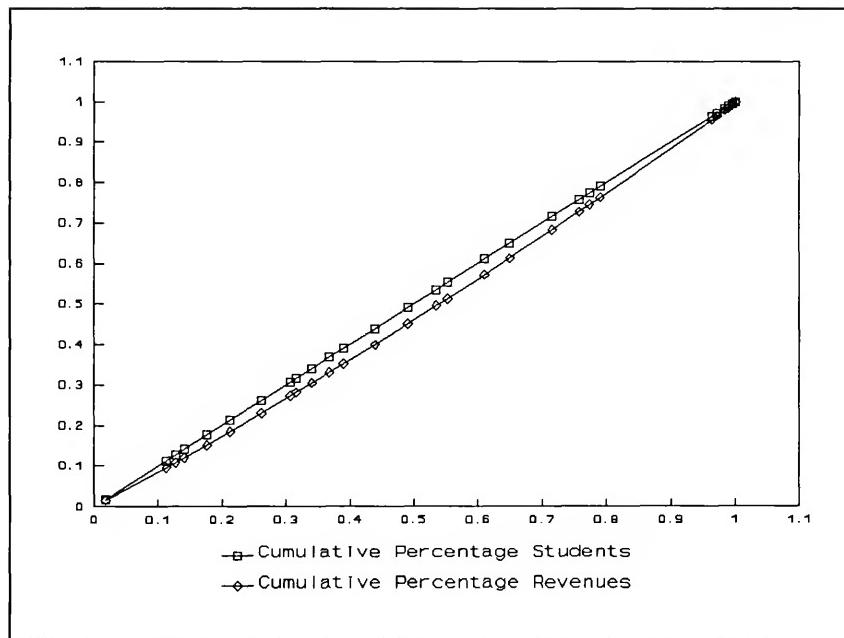


Figure 4-3. Lorenz curve for total per-student revenues for fiscal year 1989-1990.

Total Revenue Equity Summary

The trend in horizontal equity based on total per-student revenues for the 10-year period varied based on the particular indicator and the aspect of horizontal equity that the equity measure was sensitive to measuring. Table 4-13 lists the horizontal equity measure, the slope of the time series linear regression, and the standard error of the slope coefficient for each of the six horizontal equity measures.

Table 4-13

Summary of Total Per-student Revenue Equity Time Series
Linear Regression Slope and Standard Error of the Estimate
of the Slope by Equity Measure for 1980-81 Through 1989-90

EQUITY MEASURE	SLOPE	STD. ERROR OF THE EST.
Gini coefficient	-0.00333	0.00122
Coefficient of var.	-0.00522	0.00151
McLoone index	0.00267	0.00213
Federal range ratio	-0.00753	0.00937
Restricted range	34.626	23.555
Range	95.177	45.964

Table 4-14

Summary of Total Per-student Revenue Equity Trend by Equity Measure for the 10-Year period 1980-81 Through 1989-90

EQUITY MEASURE	EQUITY TREND
Gini coefficient	Increasing equity
Coefficient of variation	Increasing equity
McLoone index	Increasing equity
Federal range ratio	Inconclusive
Restricted range	Decreasing equity
Range	Decreasing equity

Table 4-14 is a summary of the equity trends for the six horizontal equity measures based on the time series linear regression results. The three of the six measures had increasing equity trends as did the fourth measure, the federal range ratio, except that it was statistically inconclusive. The other two range equity measures had decreasing equity trends.

Revenue Sources Equity Trend

The second research question--was there a trend in per-student horizontal fiscal equity for the three major components of revenues, (i.e., the foundation funding provided by the state; student fees; and other sources) for the 10 fiscal year period based on the K-12 public education horizontal fiscal equity measurement criteria--required calculating the per-student (per FTE) revenues by major source (Community College Program Fund (CCPF), student fees, and other) for each institution for each year of the study. These raw data are listed in Appendix A, Table A-1 for FTE, Table A-4 for CCPF, Table A-5 for student fees, Table A-6 for state other revenues, Table A-7 for local other revenues, and Table A-8 for federal revenues. State other revenue, local other revenue, and federal revenue were combined into the "other revenue" category for the purpose of this analysis. The results are presented by equity measure for each of the three sources of revenue used in this study.

Gini Coefficient

The Gini coefficient was the measure of the portion of revenues available to the corresponding portion of the students. See Table 4-15 for the Gini coefficient by revenue source for the 10-year period of this study.

Table 4-15

Gini Coefficient for Per-Student Revenues by Source

FISCAL YEAR	CCPF	FEES	OTHER
1980-1981	0.0722	0.1612	0.2516
1981-1982	0.0574	0.1399	0.1926
1982-1983	0.0493	0.1490	0.2571
1983-1984	0.0520	0.1326	0.1338
1984-1985	0.0579	0.1259	0.2410
1985-1986	0.0575	0.1436	0.2552
1986-1987	0.0433	0.1231	0.2262
1987-1988	0.0502	0.1199	0.1582
1988-1989	0.0482	0.1279	0.1217
1989-1990	0.0523	0.1245	0.0809

The lowest level of equity for CCPF was found in FY 1980-81 at 0.0722 and the highest level of equity was found in FY 1986-87 at 0.0433. The least level of equity for student fees was found in FY 1980-81 at 0.1612 and the highest level of equity was found in FY 1987-88 at 0.1199. The least level of equity for other revenues was found in FY 1982-83 at 0.2571 and the highest level of equity was found in FY 1989-90 at 0.0809.

The slope of the time series linear regression using the Gini coefficients for the 10-year period was -0.00333

for the CCPF, -0.00345 for student fees, and -0.01355 for other revenues (see Tables 4-15, 4-16, and 4-17).

Table 4-15

Gini Coefficient Regression Output for CCPF Revenue Source

Regression Output:	
Constant	0.062888765353
Std Err of Y Est	0.006602924917
R Squared	0.380390462849
No. of Observations	10
Degrees of Freedom	8
X Coefficient(s)	-0.00161105416
Std Err of Coef.	0.000726958108

Table 4-16

Gini Coefficient Regression Output for Student Fees Revenue Source

Regression Output:	
Constant	0.153767269342
Std Err of Y Est	0.008751812189
R Squared	0.616613034002
No. of Observations	10
Degrees of Freedom	8
X Coefficient(s)	-0.00345623837
Std Err of Coef.	0.00096354281

Table 4-17

Gini Coefficient Regression Output for Other Revenue Source

Regression Output:	
Constant	0.266367163564
Std Err of Y Est	0.052471183554
R Squared	0.407547593671
No. of Observations	10
Degrees of Freedom	8
X Coefficient(s)	-0.01355193507
Std Err of Coef.	0.005776887181

The negative slope of the time series linear regression for each of the three revenue sources indicated a trend toward increased equity during the 10-year period. All revenue sources had Gini coefficient trends that indicated increased equity as did the total revenue Gini coefficient (see Table 4-2). Equity increased as the index approached zero (Wood et al., 1984).

Coefficient of Variation

The coefficient of variation was the standard deviation of the per-student revenues of the institutions divided by the mean and expressed as a percentage (see Table 4-19).

Table 4-19

Coefficient of Variation for Per-Student Revenues by Source

FISCAL YEAR	CCPF	FEES	OTHER
1980-1981	0.1483	0.3024	0.3749
1981-1982	0.1461	0.2706	0.3206
1982-1983	0.1145	0.2662	0.4925
1983-1984	0.1237	0.2404	0.2537
1984-1985	0.1172	0.2265	0.3854
1985-1986	0.1161	0.2610	0.5255
1986-1987	0.0907	0.2202	0.3837
1987-1988	0.0989	0.2136	0.2997
1988-1989	0.1031	0.2273	0.2722
1989-1990	0.1027	0.2202	0.1597

Note: The coefficient of variation is listed in the table as the decimal equivalent of the percentage.

A decreasing coefficient of variation indicated increased equity. As the coefficient of variation approaches 0.0%, the equity increases. The least level of

equity for CCPF was found in FY 1980-81 at 0.1483 and the highest level of equity was found in FY 1986-87 at 0.0907. The least level of equity for student fees was found in FY 1980-81 at 0.3024 and the highest level of equity was found in FY 1987-88 at 0.2136. The least level of equity for other revenues was found in FY 1985-86 at 0.5255 and the highest level of equity was found in FY 1989-90 at 0.1597.

The slope of the time series linear regression for the coefficient of variation for the 10-year period was -0.00539 for the CCPF, -0.00807 for student fees, and -0.01642 for other revenues (see Tables 4-20, 4-21, and 4-22). The negative slope of each of the three revenue sources time series linear regression indicated a trend toward increased equity during the 10-year period. All revenue sources had coefficients of variation trends that indicated increased equity as did the total revenue coefficient of variation (see Table 4-4).

Table 4-20

Coefficient of Variation Regression Output for CCPF Revenue Source

Regression Output:	
Constant	0.145789811103
Std Err of Y Est	0.010548875797
R Squared	0.729418357143
No. of Observations	10
Degrees of Freedom	8
X Coefficient(s)	-0.00539340928
Std Err of Coef.	0.001161393002

Table 4-21

Coefficient of Variation Regression Output for Student Fees Revenue Source

Regression Output:	
Constant	0.289253507731
Std Err of Y Est	0.016496674136
R Squared	0.711920020853
No. of Observations	10
Degrees of Freedom	8
Coefficient(s)	-0.00807557546
Std Err of Coef.	0.001816224047

Table 4-22

Coefficient of Variation Regression Output for Other Revenue Source

Regression Output:	
Constant	0.437115964956
Std Err of Y Est	0.104086718622
R Squared	0.204280014127
No. of Observations	10
Degrees of Freedom	8
X Coefficient(s)	-0.01642275988
Std Err of Coef.	0.011459570563

McLoone Index

The McLoone index was the ratio of the sum of the actual revenues for students below the mean to the equivalent per-student mean revenue value summed for all students below the mean. In evaluating the McLoone index, the closer the McLoone index is to 1.0, the greater the horizontal equity (see Table 4-23). The McLoone index is sensitive to the lower half of the distribution.

Table 4-23

McLoone Index for Per-Student Revenues by Source

FISCAL YEAR	CCPF	FEES	OTHER
1980-1981	0.9533	0.6941	0.7849
1981-1982	0.9586	0.7008	0.8597
1982-1983	0.9498	0.7211	0.8774
1983-1984	0.9606	0.7129	0.8963
1984-1985	0.9185	0.7421	0.7915
1985-1986	0.9036	0.6951	0.8502
1986-1987	0.9375	0.7585	0.8656
1987-1988	0.9289	0.7446	0.8540
1988-1989	0.9397	0.7617	0.8924
1989-1990	0.9391	0.7710	0.9072

The least level of equity for CCPF was found in FY 1985-86 at 0.9036 and the highest level of equity was found in FY 1983-84 at 0.9606. The least level of equity for student fees was found in FY 1980-81 at 0.6941 and the highest level of equity was found in FY 1989-90 at 0.7710. The least level of equity for other revenues was found in FY 1980-81 at 0.7849 and the highest level of equity was found in FY 1989-90 at 0.9072.

The slope of the time series linear regression for the McLoone index for the 10-year period was -0.00271 for the CCPF, 0.00803 for student fees, and 0.00714 for other revenues (see Tables 4-24, 4-25, and 4-26).

Table 4-24

McLoone Index Regression Output for CCPF Revenue Source

Regression Output:	
Constant	0.953928270035
Std Err of Y Est	0.017109043197
R Squared	0.206735866723
No. of Observations	10
Degrees of Freedom	8
X Coefficient(s)	-0.00271983618
Std Err of Coef.	0.001883643662

Table 4-25

McLoone Index Regression Output for Student Fees Revenue Source

Regression Output:	
Constant	0.685989668305
Std Err of Y Est	0.016820323062
R Squared	0.701836071343
No. of Observations	10
Degrees of Freedom	8
X Coefficient(s)	0.008036050249
Std Err of Coef.	0.001851856621

Table 4-26

McLoone Index Regression Output for Other Revenue Source

Regression Output:	
Constant	0.818595979506
Std Err of Y Est	0.037313577426
R Squared	0.274524744376
No. of Observations	10
Degrees of Freedom	8
X Coefficient(s)	0.007147667704
Std Err of Coef.	0.004108089669

Federal Range Ratio

The federal range ratio was the 95th percentile range value minus the 5th percentile range value divided by the 5th percentile range value. The closer the ratio was to 0.0 the greater was the equity. The federal range ratio guideline for K-12 equity is a maximum of 0.25 (Federal Register, 1976). The federal range ratios for the 10 fiscal years are listed in Table 4-27.

Table 4-27

Federal Range Ratio for Per-Student Revenues by Source

FISCAL YEAR	CCPF	FEES	OTHER
1980-1981	0.3347	1.6300	2.6215
1981-1982	0.5765	1.3245	1.9293
1982-1983	0.2452	1.2494	3.1109
1983-1984	0.2489	1.0877	1.0076
1984-1985	0.4827	0.9865	1.3146
1985-1986	0.4372	1.2621	1.8681
1986-1987	0.2511	0.9777	1.5218
1987-1988	0.2869	1.0393	1.5207
1988-1989	0.2983	0.9999	1.4777
1989-1990	0.3205	0.9360	0.8130

The least level of equity for CCPF was found in FY 1981-82 at 0.5765 and the highest level of equity was found in FY 1982-83 at 0.2452. The least level of equity for student fees was found in FY 1980-81 at 1.6300 and the highest level of equity was found in FY 1989-90 at 0.9360. The least level of equity for other revenues was found in FY 1982-83 at 3.1109 and the highest level of equity was found

in FY 1989-90 at 0.8130. Only the FY 1982-83 and FY 1983-84 federal range ratio for CCPF, 0.2452 and 0.2489 respectively, were within the federal minimum guideline of 0.250 for horizontal equity. For all years, all indicators for the three revenue sources exceeded the federal K-12 guideline.

The slope of the time series linear regression for the federal range ratio for the 10-year period was -0.01154 for the CCPF, -0.05832 for student fees, and -0.1532 for other revenues (see Tables 4-28, 4-29, and 4-30).

Table 4-28

Federal Range Ratio Regression Output for CCPF Revenue Source

Regression Output:	
Constant	0.411714366253
Std Err of Y Est	0.114147342584
R Squared	0.095470744649
No. of Observations	10
Degrees of Freedom	8
X Coefficient(s)	-0.01154802381
Std Err of Coef.	0.012567208807

Table 4-29

Federal Range Ratio Regression Output for Student Fees Revenue Source

Regression Output:	
Constant	1.470081242732
Std Err of Y Est	0.133967675541
R Squared	0.661517833769
No. of Observations	10
Degrees of Freedom	8
X Coefficient(s)	-0.05832045771
Std Err of Coef.	0.014749355647

Table 4-30

Federal Range Ratio Regression Output for Other Revenue Source

Regression Output:	
Constant	2.561622094789
Std Err of Y Est	0.559781070522
R Squared	0.436083715135
No. of Observations	10
Degrees of Freedom	8
X Coefficient(s)	-0.15329000692
Std Err of Coef.	0.061629867505

The standard error of the coefficient for CCPF revenues exceeded the magnitude of the slope, indicating that negative, neutral, and positive slopes were possible within the confidence interval of the estimate of the slope. The equity trend was inconclusive for the CCPF revenue source.

Revenue Sources Equity Trend Summary

Table 4-31 is the summary of revenue source per-student equity time series linear regression slope and standard error of the estimate of the slope by equity measure for the 10-year period 1980-81 through 1989-90. With the exception of the federal range ratio slope for the CCPF, all slopes were indicative of conclusive trends.

Table 4-32 is the summary of the revenue source per-student equity trend by equity measure for the 10-year period 1980-81 through 1989-90. The analysis of the slopes indicated increasing equity for the three revenue sources except for the CCPF. The CCPF equity trend was decreasing

based on the McLoone index, and the CCPF equity trend was inconclusive based on the federal range ratio.

Table 4-31
Summary of Revenue Source Per-Student Equity Time Series
Linear Regression Slope and Standard Error of the Estimate
of the Slope by Equity Measure for the 10-Year period 1980-
81 Through 1989-90

EQUITY MEASURE	REVENUE SOURCE	SLOPE	STANDARD ERROR OF THE ESTIMATE
Gini coefficient			
	CCPF	-0.00161	0.00072
	Fees	-0.00345	0.00096
	Other	-0.01355	0.00577
Coefficient of variation			
	CCPF	-0.00539	0.00116
	Fees	-0.00807	0.00181
	Other	-0.01642	0.01145
McLoone index			
	CCPF	-0.00271	0.00188
	Fees	0.00803	0.00185
	Other	0.00714	0.00410
Federal range ratio			
	CCPF	-0.01154	0.01256
	Fees	-0.05832	0.01474
	Other	-0.15329	0.06162

Table 4-32

Summary of Revenue Source Per-student Equity Trend by Equity Measure for the 10-Year period 1980-81 Through 1989-90

EQUITY MEASURE	EQUITY SOURCE	EQUITY TREND
Gini coefficient		
	CCPF	Increasing Equity
	Fees	Increasing Equity
	Other	Increasing Equity
Coefficient of variation		
	CCPF	Increasing Equity
	Fees	Increasing Equity
	Other	Increasing Equity
McLoone index		
	CCPF	Decreasing Equity
	Fees	Increasing Equity
	Other	Increasing Equity
Federal range ratio		
	CCPF	Inconclusive
	Fees	Increasing Equity
	Other	Increasing Equity

Revenue Sources Relative Horizontal Equity

For the second part of question two: what was the contribution of the three major components of revenue to the total per-student horizontal fiscal equity, time series linear regression was used to analyze the relative

contribution of the three revenue components to the resulting per-student expenditure equity for each of the four equity measurement indicators. The y intercept and the slope of the time series linear regression were used to examine the relative contribution of the sources of revenue to the total revenue equity. The results are presented by equity indicator.

Gini Coefficient

In order by equity level, the CCPF was the most equitable revenue source followed by student fees and other based on the Gini coefficient. It should be noted that the rate of change of the trend was in exactly the reverse order with other revenue becoming more equitable at a faster rate followed by student fees and the CCPF (see Tables 4-15, 4-16, and 4-17).

In relationship to the total revenue equity, CCPF was more equitable than total revenue during 5 years of the 10-year period and less equitable during 5 years (see Tables 4-1 and 4-14). Student fees and other revenue were less equitable than total revenue in all 10 years of this study. The results are summarized in Table 4-33 along with the results from the other equity measures.

Coefficient of Variation

In order by equity level, the CCPF was the most equitable revenue source followed by student fees and other revenues based on the coefficient of variation. It should

be noted that the rate of change of the trend was in exactly the reverse order with other revenue becoming more equitable at a faster rate followed by student fees and the CCPF (see Tables 4-18, 4-19, and 4-20). Both of these relationships were the same as for the Gini coefficient.

In relationship to the total revenue equity, CCPF was more equitable than total revenue during 1 year of the 10-year period and less equitable during 9 years (see Tables 4-3 and 4-19). Student fees and other revenue were less equitable than total revenue in all 10 years of this study. These results are summarized in Table 4-33 along with the results from the other equity measures.

McLoone Index

In order by equity level, the CCPF was the most equitable revenue source followed by other revenues and student fees based on the McLoone index. Other revenues and student fees reversed order from the order in both the Gini coefficient and coefficient of variation. For the McLoone index, the pattern of the rate of change of the trend was different than in the first two measures. The CCPF revenue source was becoming less equitable, the only case in this study of an opposite trend for a revenue source from the trend of the total revenue for the same equity measure. Student fee revenues were becoming more equitable at a faster rate than by other revenues (see Tables 4-24, 4-25, and 4-26). These relationships were considerably different

than observed for either the Gini coefficient or the coefficient of variation.

Relative to total revenue equity, CCPF was more equitable than total revenue during 7 years of the 10-year period and less equitable during 3 years (see Tables 4-5 and 4-23). Student fees and other revenue were less equitable than total revenue all years of this study. The results are summarized in Table 4-33 along with the results from the other equity measures.

Federal Range Ratio

In order by equity level, the CCPF was the most equitable revenue source followed by student fees and other revenues, based on the federal range ratio. This matched the order of both the Gini coefficient and coefficient of variation equity order. For the federal range ratio, the pattern of the rate of change of the trend was different than was observed for the previously discussed three measures. Other revenue had the best rate of equity improvement followed by the CCPF and student fees (see Tables 4-28, 4-29, and 4-30). These trend relationships were considerably different than observed for the Gini coefficient, McLoone index, or the coefficient of variation.

Relative to total revenue equity, CCPF was more equitable than total revenue during 6 years of the 10-year period and less equitable during 4 years (see Tables 4-7 and 4-27). Student fees and other revenue were less equitable

Table 4-33

Summary of the Revenue Sources Relative Equity, Comparison of Relative Annual Equity of Revenue Sources and Total Revenue, and Source Equity Trend Comparison by Equity Measure

EQUITY MEASURE	REVENUE SOURCES (RELATIVE EQUITY ORDER)	REVENUE SOURCE COMPARED TO TOTAL REVENUE EQUITY		REVENUE SOURCE RELATIVE EQUITY TREND COMPARISON BY EQUITY MEASURE
		NBR. BETTER	YRS.	
Gini coefficient				
	(1) CCPF	5	5	Least Increasing
	(2) Fees	0	10	Increasing
	(3) Other	0	10	Most Increasing
Coefficient of variation				
	(1) CCPF	1	9	Least Increasing
	(2) Fees	0	10	Increasing
	(3) Other	0	10	Most Increasing
McLoone index				
	(1) CCPF	7	3	Decreasing
	(2) Other	0	10	Least Increasing
	(3) Fees	0	10	Most Increasing
Federal range ratio				
	(1) CCPF	6	4	Inconclusive
	(2) Fees	0	10	Least Increasing
	(3) Other	0	10	Most Increasing

than total revenue for all years of this study. The results are summarized in Table 4-33 along with the results from the other equity measures.

Revenue Sources Relative Equity Trend Summary

The relationships of the revenue sources were found to be varied based on the equity measure. Table 4-33 is a summary of three aspects of the horizontal equity relationship of the sources of revenue, relative equity order, relative equity annual performance, and the equity trend of the three revenue sources. The CCPF ranked highest based on the four equity measures. Fees ranked second in all except the McLoone index that is sensitive to the lower half of the distribution. Other revenue ranked lowest based on all measures except the McLoone index where it ranked in the middle.

The comparison of the annual equity measures for total revenues with the revenue sources yielded the following results. The only revenue source to have higher equity than the total revenue was the CCPF. The CCPF was higher during 5 years for the Gini coefficient, 1 year for the coefficient of variation, 7 years for the McLoone index and 6 years for the federal range ratio (see Table 4-33).

The CCPF was the revenue source with the lowest rate of change in equity during the study period based on the slope of the time series linear regression analyses. The CCPF had the least increasing slope based on the Gini coefficient, a

decreasing slope based on the McLoone index, and a statistically inconclusive slope direction based on the federal range ratio horizontal equity measure. The CCPF had the least increasing slope in two cases, a decreasing slope in one case, and a statistically inconclusive slope in one case. The remaining two revenue sources, student fees and other, had slopes that indicated increasing horizontal equity at varying relative rates for all four Wood et al. (1984) criterion.

Summary

This chapter reviews the total per-student revenues, based on the six horizontal equity measures, and the per-student revenue sources, based on the four Wood et al. (1984) criterion for horizontal fiscal equity. The trend in the equity based on the measures was determined based on the slope of the time series linear regression analyses. Chapter Five contains the observations and conclusions based on these analyses.

CHAPTER FIVE
OBSERVATIONS AND CONCLUSIONS

Introduction

The purpose of this study was to extend the discussion of horizontal fiscal equity as it relates to public K-12 education to the multiple institution public community college system by examining selected horizontal equity measures and analyzing the temporal trend of the horizontal equity over a 10-year period. The horizontal fiscal equity was based on per-student revenues, that resulted from the distribution of the major sources of revenues (state funding formula, student fees, and other revenue).

The horizontal equity measurement methodology used in public K-12 horizontal equity studies was applied to public community college per-student revenues and revenue sources. The research methodology was nonexperimental, used population data for the 28 community colleges of the State of Florida (see Table B-1), and utilized the 10 fiscal year period from 1980-81 to 1989-90. The Per-Pupil Revenue Disparity Criterion for evaluating secondary education funding horizontal equity (Wood et al., 1984) were used with the addition of the range and restricted range (Berne & Stiefel, 1984; Gurwitz, 1982; Jordan & McKeown, 1980).

The six horizontal equity measures: range, restricted range, federal range ratio, McLoone index, coefficient of variation, and the Gini coefficient were used because the six measures "reasonably represent the diversity of value judgements that are incorporated in horizontal-equity measures" (Berne & Stiefel, 1984, p. 64).

The purpose of this chapter is to present the observations and conclusions of this study based on the examination and analysis of the data. There were two research questions and the results are presented for each question under the headings total revenue equity trend for the first research question and revenue source equity trend for the second research question.

Total Revenue Equity Trend

The first research question--was there a trend in per-student horizontal fiscal equity, based on per-student total revenues, for the state's public community college system for the fiscal year periods 1980-81 through 1989-90 based on the K-12 public education per-pupil fiscal equity measurement criteria for horizontal equity--is discussed first.

The graph in Figure 5-1 depicts the per-student total revenue horizontal fiscal equity trend based on the slope of the time series linear regression analyses of the four Wood et al. (1984) horizontal fiscal equity measures: Gini coefficient, coefficient of variation, McLoone index, and

federal range ratio. The four equity measures have trends that indicate increasing equity over the 10-year period; however, the federal range ratio was statistically inconclusive.

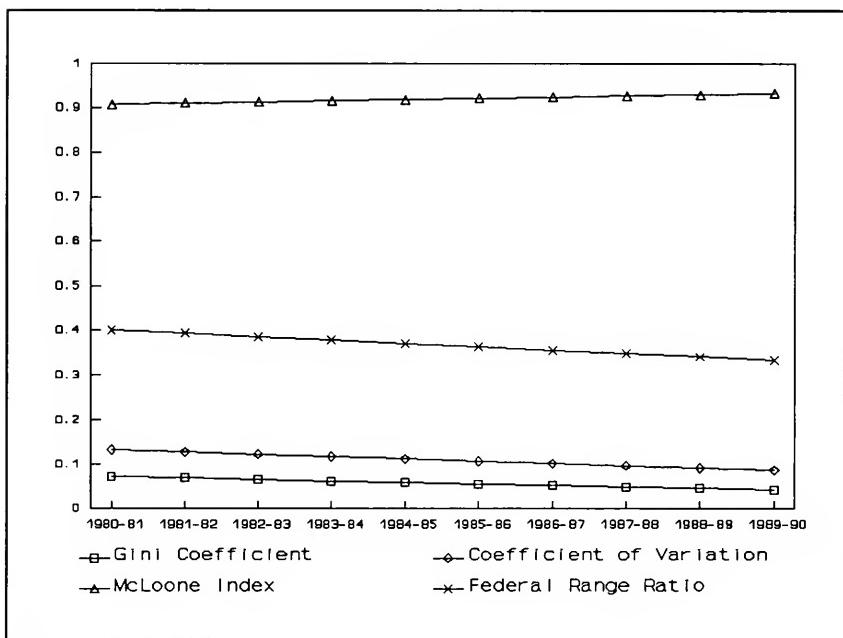


Figure 5-1. Graph of the Gini coefficient, coefficient of variation, McLoone index, and federal range ratio for total per-student revenues for the period 1980-81 through 1989-90.

The graph in Figure 5-2 depicts the per-student total revenue horizontal fiscal equity trend based on the slope of the time series linear regression analyses of the range and restricted range horizontal fiscal equity measures. The two equity measures, range and restricted range, have trends that indicate decreasing equity over the 10-year period.

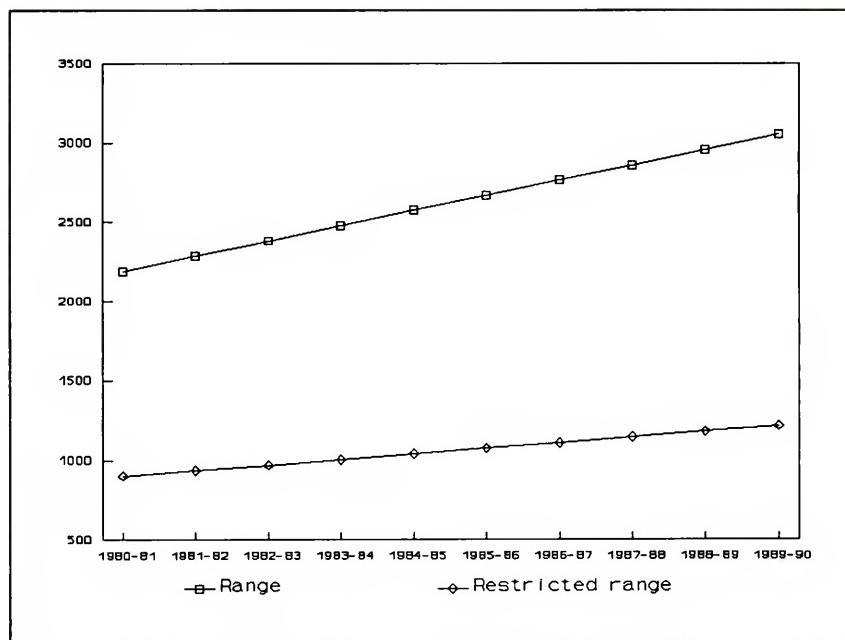


Figure 5-2. Graph of the range and restricted range for per-student total revenues for the period 1980-81 through 1989-90.

The three equity measures, Gini coefficient, coefficient of variation, and McLoone index, have trends that indicate improving equity for the distribution as a whole, the center of the distribution, and the lower half of the distribution respectively (see Figure 5-1). The three range measures, federal range ratio, range, and restricted range have equity trends that are decreasing (see Figures 5-1 and 5-2); however, the equity trend of the federal range ratio is statistically inconclusive.

Revenue Sources Equity Trend

The second research question--was there a trend in per-student horizontal fiscal equity of the three major components of revenues, (i.e., the foundation funding provided by the state; student fees; and other sources) for the 10 fiscal year period based on the K-12 public education horizontal fiscal equity measurement criteria--required examining and analyzing the revenues by major source (Community College Program Fund (CCPF), student fees, and other). State other revenue, local other revenue, and federal revenue were combined into the "other revenue" category for the purpose of this analysis.

The graphs in Figures 5-3, 5-4, 5-5, and 5-6 depict the equity trend for the four Wood et al. (1984) measures: Gini coefficient, coefficient of variation, McLoone index, and federal range ratio. The graphs include the total per-student revenue trend line and the per-student revenue source trend lines for each of the four horizontal fiscal equity measures.

The graph in Figure 5-3 depicts the horizontal fiscal equity trend of the per-student sources of revenues and the per-student total revenues based on the Gini coefficient. The relative level of horizontal fiscal equity and the relative rate of change of the equity trend can be observed. The least equitable revenue source, other revenue, had the highest rate of improving equity trend based on the Gini

coefficient. This contributed to the total revenue trend line crossing the trend line of the most equitable revenue source, the CCPF. Note that the trend lines cross in the FY 1986-87 time frame (see Figure 5-3).

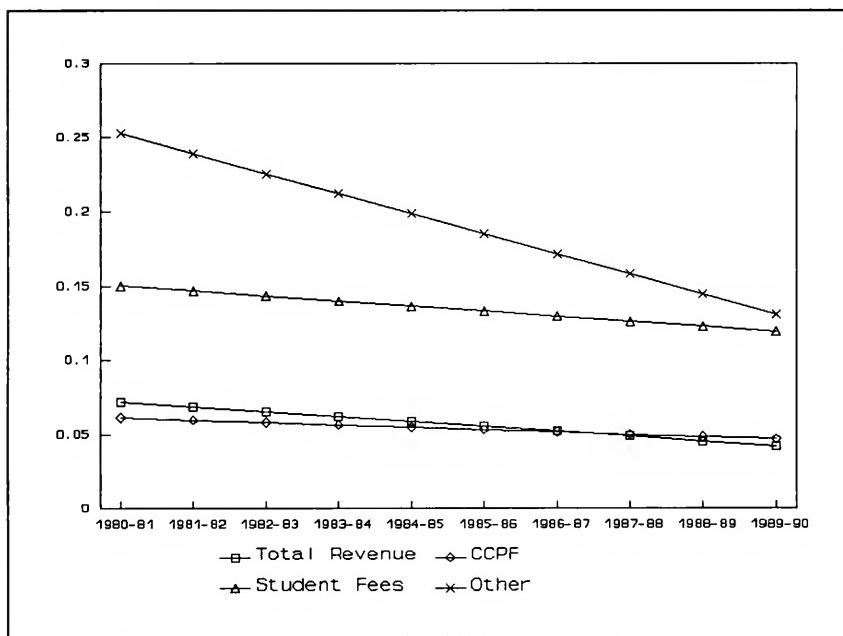


Figure 5-3. Graph of the Gini coefficient for per-student total revenues, CCPF revenues, student fees, and other revenues for the period 1980-81 through 1989-90.

The graph in Figure 5-4 depicts the horizontal fiscal equity trend of the per-student sources of revenues and the per-student total revenues based on the coefficient of variation. The relative level of horizontal fiscal equity and the relative rate of change of the equity trend can be observed. As also indicated by the Gini coefficient, the

least equitable revenue source, other revenue, had the highest rate of improving equity trend based on the coefficient of variation. This contributed to the total revenue trend exceeding all of the revenue sources. Note that the trend line for total revenues is below the revenue sources trend lines (see Figure 5-4).

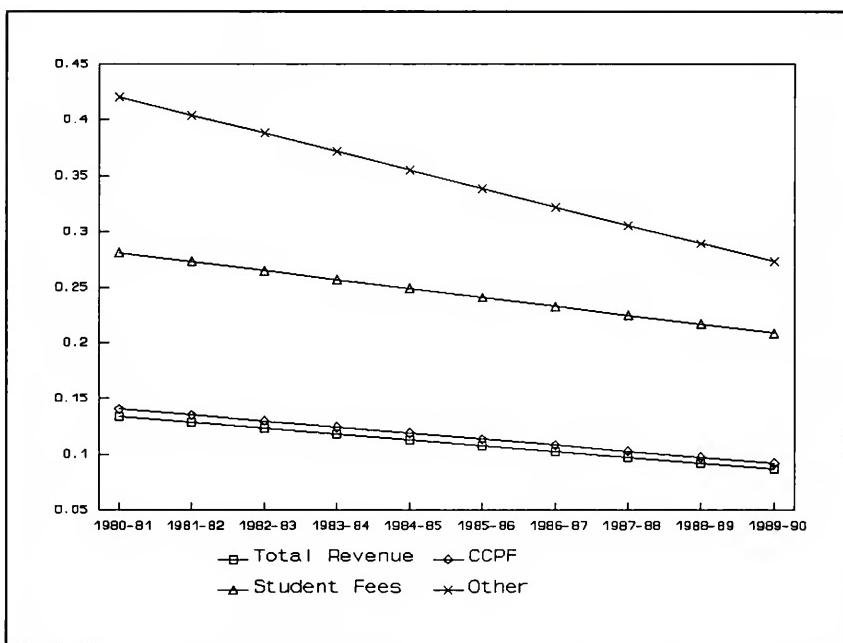


Figure 5-4. Graph of the coefficient of variation for per-student total revenues, CCPF revenues, student fees, and other revenues for the period 1980-81 through 1989-90.

The graph in Figure 5-5 depicts the horizontal fiscal equity trend of the per-student sources of revenues and the per-student total revenues based on the McLoone index. The relative level of horizontal fiscal equity and the relative

rate of change of the equity trend can be observed. The least equitable revenue source is student fees and the trend of CCPF is decreasing and crosses the total revenue trend line (see Figure 5-5).

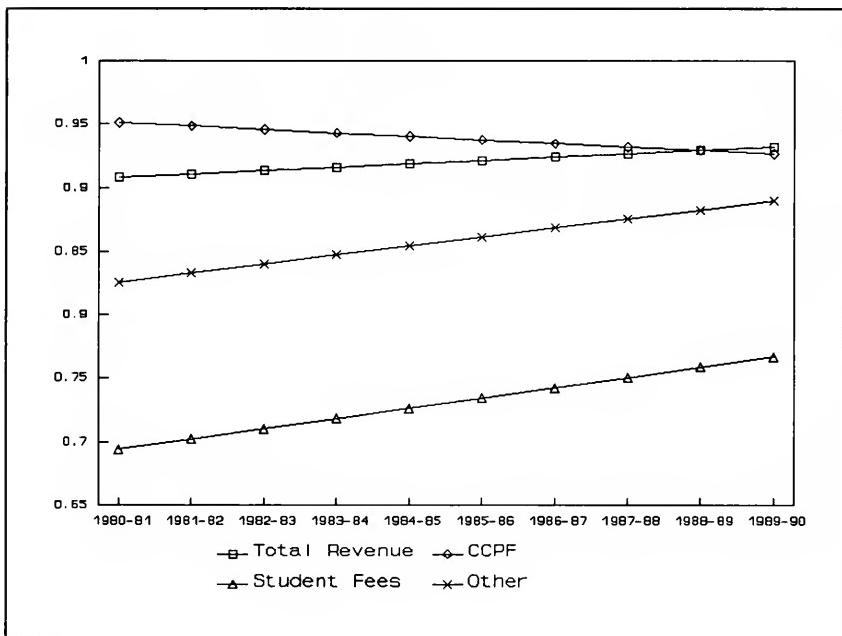


Figure 5-5. Graph of the McLoone index for per-student total revenues, CCPF revenues, student fees, and other revenues for the period 1980-81 through 1989-90.

The graph in Figure 5-6 depicts the horizontal fiscal equity trend of the per-student sources of revenues and the per-student total revenues based on the federal range ratio. The relative level of horizontal fiscal equity and the relative rate of change of the equity trend can be observed. As also indicated by the Gini coefficient and the

coefficient of variation, the least equitable revenue source, other revenue, had the highest rate of improving equity trend based on the federal range ratio (see Figure 5-6). The trend of the CCPF was statistically inconclusive.

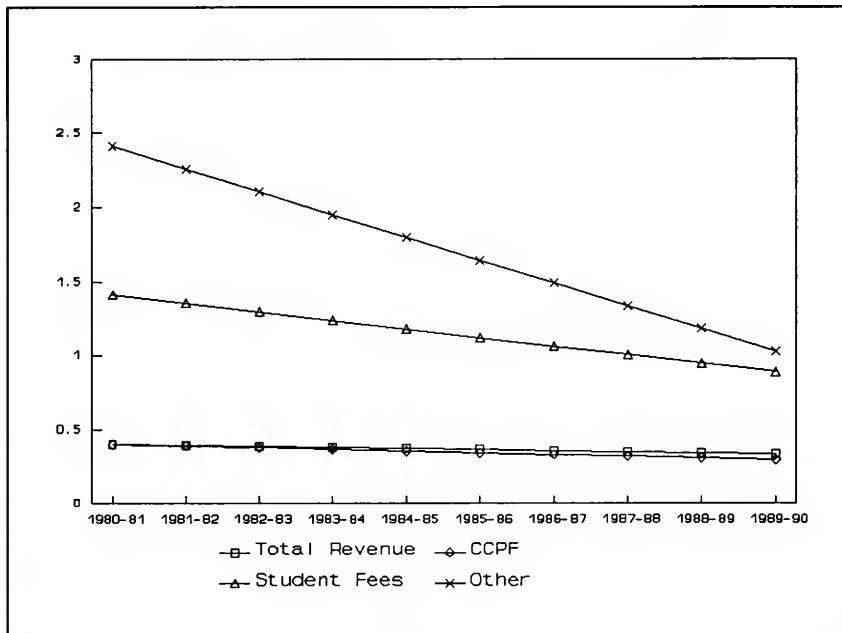


Figure 5-6. Graph of the federal range ratio for per-student total revenues, CCPF revenues, student fees, and other revenues for the period 1980-81 through 1989-90.

Conclusions and Implications of the Study

There is a statistically conclusive trend in the per-student total revenue horizontal fiscal equity for the State of Florida community college system. The trend was conclusive for 5 of the 6 horizontal fiscal equity measures utilized in this study. For per-student total revenues, the

horizontal fiscal equity trend was toward increasing equity except for range related horizontal fiscal equity. The range related horizontal equity measures are sensitive to the difference between the community colleges receiving the highest levels of per-student revenues and the community colleges receiving the lowest levels of per-student revenues. The difference is increasing both numerically and as a ratio with the low per-student revenue levels as the denominator. This effect is mathematically inherent in a cost-plus budget approach as is utilized by the State of Florida to fund community colleges.

For revenue source relative horizontal equity and equity trend, the CCPF provided high levels of horizontal equity and an increasing equity trend with the exception of the range problem. The other two major revenue sources, student fees, and other revenue, adversely affected the total revenue level and partially offset the high level of equity of the CCPF. This is because the other two revenue sources have considerably lower levels of horizontal equity. The relatively lower percentage of revenue contributed by the two revenue sources, a certain amount of intermeshing of the various revenue components, and higher rates of change toward increased equity of the two revenue sources contributed to the resulting total equity.

Analyses of the results of this study indicate that the CCPF generally exhibits high levels of horizontal per-

student revenue equity with a trend toward even higher levels of equity. The CCPF should be continued but modified to improve the range related horizontal fiscal equity. Student fees and other current general fund revenues were found to decrease the overall high level of equity provided by the CCPF. Special allocations and education enhancement funds are major components of the other revenue category. The other revenue category was the least equitable revenue source, and efforts should be made to either control or at least recognize the effect of this category on the total per-student horizontal fiscal equity.

Recommendations

The funding methodology used by the State of Florida has resulted in a temporal trend toward increased equity in the distribution of revenues to the institutions in the system over the 10-year period with the exception of range related horizontal fiscal equity. The foundation funding methodology (approximately 65% of total revenues) used by the State of Florida is predominantly a cost-plus approach. The cost-plus approach to budget allocation inherently produces a broadening range, as was observed in this study by the results of the range sensitive horizontal fiscal equity measures. Increasing both extremes of a range by the same percentage, mathematically increases the range by an amount equal to the difference in the extremes times the same percent increase. Unless offset by some other funding

action, range related horizontal equity will decrease using the cost-plus approach for annual funding. The recommendations are:

1. It is recommended that horizontal fiscal equity goals be adopted by the State of Florida for the community college system.

2. In concert with the adopted goals, it is recommended that priority be given to rectifying the range related equity problem and that the State of Florida adopt, as a minimum, the federal guideline of 0.25 for the federal range ratio.

3. It is recommended that all sources of revenue be recognized and accounted for in the funding methodology not just "student fees and state appropriations" as recommended in the Florida Community College Finance: Update (Postsecondary Education Planning Commission, 1991, p. 19).

4. It is recommended that special allocations be limited and evaluated prior to implementations for equity impact.

5. It is recommended that the base funding levels be evaluated and adjusted as a method of correcting the range related equity problem.

Recommendations for Further Study

The following are recommendations for further study that were recognized during this study:

1. It is recommended that the issue of lottery funded education enhancement for the community college system be evaluated for equity impact.
2. Due to the methodology change in the CCPF for FY 1990-91, it is recommended that the horizontal fiscal equity for FY 1990-91 be evaluated and compared to the results of this study when the data are available.
3. It is recommended that the effect of the corridor funding approach utilized by the State of Florida be evaluated for horizontal equity impact.
4. It is recommended that the horizontal fiscal equity of other state community college systems be evaluated in order to broaden the base and determine the norms for horizontal equity on a national scale.

APPENDIX A

RAW DATA

Table A-1

State of Florida Community Colleges Full-Time Equivalent
Students for Fiscal Years 1980-81 Through 1989-90

INSTITUTION	1989/90	1988/89	1987/88
BREVARD	8452.4	7809.9	7491.6
BROWARD	11341.4	10330.0	9700.9
CENTRAL FLORIDA	2852.2	2443.0	2406.4
CHIPOLA	1424.0	1348.5	1135.6
DAYTONA BEACH	7714.6	6917.7	6708.6
EDISON	3746.1	3251.2	3104.1
FLA CC AT JAX	16192.4	14349.6	12304.8
FLORIDA KEYS	850.0	729.2	760.3
GULF COAST	2667.6	2616.7	2423.8
HILLSBOROUGH	8301.4	7450.3	6562.3
INDIAN RIVER	6061.7	5419.4	4958.8
LAKE CITY	2015.4	1830.2	1707.9
LAKE-SUMTER	1018.2	918.3	888.4
MANATEE	4170.4	3918.8	3632.3
MIAMI-DADE	29504.0	27496.3	26126.2
NORTH FLORIDA	917.3	870.4	859.5
OKALOOSA-WALTON	3103.0	2597.8	2246.3
PALM BEACH	7613.9	6653.4	6306.2
PASCO-HERNANDO	2458.3	2108.4	1832.9
PENSACOLA	7137.4	7669.8	7260.0
POLK	2975.1	2739.7	2442.3
ST. JOHNS RIVER	1615.0	1336.4	1109.9
ST. PETERSBURG	9723.0	9096.7	8543.6
SANTA FE	6738.7	6323.4	5731.0
SEMINOLE	6185.2	6240.0	5870.6
SOUTH FLORIDA	2320.3	2273.9	1926.1
TALLAHASSEE	4596.0	4070.9	3533.1
VALENCIA	8761.2	8030.6	7292.6
TOTAL	170456.2	156840.5	144866.1

Table A-1 (cont.)

INSTITUTION	1986/87	1985/86	1984/85
BREVARD	7270.3	6691.0	6996.3
BROWARD	9575.3	9290.4	9534.6
CENTRAL FLORIDA	2250.5	2096.6	1979.2
CHIPOLA	1067.7	1041.0	963.7
DAYTONA BEACH	6732.5	6688.1	6188.1
EDISON	2893.9	2658.6	2678.6
FLA CC AT JAX	12206.7	12134.3	11682.6
FLORIDA KEYS	678.0	692.8	753.0
GULF COAST	2269.6	2095.3	2091.3
HILLSBOROUGH	6267.7	5763.8	5696.4
INDIAN RIVER	4661.0	4715.0	4629.0
LAKE CITY	1919.1	1548.9	1578.5
LAKE-SUMTER	853.9	811.0	746.6
MANATEE	3215.5	3050.5	3020.0
MIAMI-DADE	25085.4	23995.4	23682.0
NORTH FLORIDA	784.1	702.7	641.9
OKALOOSA-WALTON	2077.7	2087.6	2172.3
PALM BEACH	6000.4	5694.1	5532.2
PASCO-HERNANDO	1649.9	1609.7	1495.0
PENSACOLA	7092.1	7087.0	7049.0
POLK	2283.4	2220.6	2366.2
ST. JOHNS RIVER	944.7	745.8	695.6
ST. PETERSBURG	8303.9	8188.9	8427.5
SANTA FE	5416.9	5140.9	4903.8
SEMINOLE	5286.5	5220.4	4917.0
SOUTH FLORIDA	1649.6	1612.1	1165.5
TALLAHASSEE	3074.3	2754.9	2560.2
VALENCIA	6631.2	6270.0	5891.7
TOTAL	138141.8	132607.4	130037.8
INSTITUTION	1983/84	1982/83	1981/82
BREVARD	7865.9	7308.1	6389.7
BROWARD	9962.8	9791.9	9111.7
CENTRAL FLORIDA	2409.4	2473.8	2045.6
CHIPOLA	927.4	924.8	962.0
DAYTONA BEACH	6710.6	6305.0	6242.7
EDISON	2749.1	2646.2	2461.2
FLA CC AT JAX	13557.1	14372.5	15021.8
FLORIDA KEYS	755.5	779.5	803.0
GULF COAST	2132.5	2032.1	2016.6
HILLSBOROUGH	6100.7	5940.7	5919.0
INDIAN RIVER	4465.3	4612.0	4825.0
LAKE CITY	1381.2	1547.0	1349.6
LAKE-SUMTER	818.9	833.1	693.4
MANATEE	3223.0	3143.6	2810.8

Table A-1 (cont.)

INSTITUTION	1983/84	1982/83	1981/82
MIAMI-DADE	24180.0	24745.9	25835.0
NORTH FLORIDA	676.0	683.1	564.1
OKALOOSA-WALTON	2295.7	2180.5	2151.6
PALM BEACH	5487.1	5598.6	5163.9
PASCO-HERNANDO	1585.5	1750.4	1599.3
PENSACOLA	7777.1	8876.9	8252.8
POLK	2538.4	2733.2	2578.1
ST. JOHNS RIVER	719.0	798.3	705.9
ST. PETERSBURG	8600.4	8587.7	8118.0
SANTA FE	5024.8	5244.3	5105.2
SEMINOLE	4830.1	5400.4	5313.4
SOUTH FLORIDA	1100.9	1165.8	1075.9
TALLAHASSEE	2598.6	2716.0	2449.5
VALENCIA	6025.6	5842.2	5882.4
TOTAL	136498.6	139033.6	135447.2
INSTITUTION	1980/81		
BREVARD	5407.1		
BROWARD	8573.8		
CENTRAL FLORIDA	2272.5		
CHIPOLA	991.5		
DAYTONA BEACH	5381.5		
EDISON	2214.5		
FLA CC AT JAX	14976.1		
FLORIDA KEYS	718.5		
GULF COAST	2061.3		
HILLSBOROUGH	6423.3		
INDIAN RIVER	3625.2		
LAKE CITY	1277.0		
LAKE-SUMTER	741.4		
MANATEE	2585.5		
MIAMI-DADE	22173.8		
NORTH FLORIDA	564.5		
OKALOOSA-WALTON	2247.2		
PALM BEACH	4964.9		
PASCO-HERNANDO	1546.3		
PENSACOLA	8677.8		
POLK	2455.3		
ST. JOHNS RIVER	716.8		
ST. PETERSBURG	7912.6		
SANTA FE	4789.2		
SEMINOLE	5019.2		
SOUTH FLORIDA	1014.2		

Table A-1 (cont.)

INSTITUTION	1980/81
TALLAHASSEE	2046.9
VALENCIA	5458.3
TOTAL	126836.2

Table A-2

State of Florida Community Colleges General Current Fund Total Expenditures for Fiscal Years 1980-81 through 1989-90

INSTITUTION	1989/90	1988/89	1987/88
BREVARD	\$35,642,223	\$31,134,458	\$28,634,109
BROWARD	51,963,851	46,543,718	43,494,597
CENTRAL FLORIDA	13,336,300	11,662,971	10,460,295
CHIPOLA	7,286,986	6,011,371	4,986,840
DAYTONA BEACH	31,999,021	29,361,866	26,119,663
EDISON	15,869,945	13,072,668	11,689,283
FLA CC AT JAX	61,228,306	52,952,887	50,219,240
FLORIDA KEYS	5,004,431	5,106,159	4,425,321
GULF COAST	12,292,748	10,663,905	9,448,212
HILLSBOROUGH	31,834,446	29,346,044	27,249,564
INDIAN RIVER	22,431,587	20,007,631	18,051,119
LAKE CITY	10,593,518	9,014,224	8,470,713
LAKE-SUMTER	5,842,065	5,385,245	4,528,446
MANATEE	16,909,552	15,267,494	13,676,854
MIAMI-DADE	138,681,614	125,363,257	113,139,161
NORTH FLORIDA	4,983,608	4,174,980	3,405,341
OKALOOSA-WALTON	11,762,087	9,989,258	8,585,947
PALM BEACH	33,526,747	28,395,809	26,061,734
PASCO-HERNANDO	8,943,809	8,040,145	6,635,573
PENSACOLA	32,554,628	30,357,831	28,507,485
POLK	12,928,284	11,996,283	10,682,919
ST. JOHNS RIVER	6,465,275	5,611,308	4,514,750
ST. PETERSBURG	46,496,138	37,671,925	34,166,601
SANTA FE	30,785,710	27,372,883	24,877,499
SEMINOLE	23,231,553	22,169,299	18,081,010
SOUTH FLORIDA	8,577,954	7,402,546	5,768,280
TALLAHASSEE	19,626,494	15,488,876	12,533,087
VALENCIA	37,921,435	31,037,793	27,207,754
TOTAL	\$738,720,314	\$650,602,834	\$585,621,397
INSTITUTION	1986/87	1985/86	1984/85
BREVARD	\$26,419,641	\$24,344,239	\$24,205,129
BROWARD	37,197,210	34,000,407	33,630,976
CENTRAL FLORIDA	8,938,868	9,199,937	8,141,998
CHIPOLA	4,753,138	4,254,756	4,116,255
DAYTONA BEACH	22,461,556	20,675,867	20,560,276
EDISON	10,321,447	9,331,265	8,856,351
FLA CC AT JAX	47,596,201	42,809,606	43,726,011
FLORIDA KEYS	4,093,757	3,832,802	3,647,457
GULF COAST	8,578,066	7,722,225	7,587,604
HILLSBOROUGH	24,295,476	21,839,269	21,381,781

Table A-2 (cont.)

INSTITUTION	1986/87	1985/86	1984/85
INDIAN RIVER	15,894,918	14,593,283	13,822,188
LAKE CITY	7,554,958	8,037,480	7,475,809
LAKE-SUMTER	4,377,125	3,911,211	4,053,758
MANATEE	12,273,983	10,613,548	10,347,592
MIAMI-DADE	101,040,199	94,325,822	88,774,139
NORTH FLORIDA	3,258,983	3,016,901	2,752,068
OKALOOSA-WALTON	7,913,358	7,590,058	6,869,806
PALM BEACH	22,526,589	19,322,762	19,510,102
PASCO-HERNANDO	5,776,723	5,768,010	5,271,192
PENSACOLA	25,447,375	25,318,479	23,522,332
POLK	10,062,378	8,925,581	8,142,506
ST. JOHNS RIVER	4,042,501	3,596,563	3,467,989
ST. PETERSBURG	33,115,212	30,310,651	28,249,822
SANTA FE	21,722,807	19,984,175	18,793,123
SEMINOLE	15,436,257	14,418,624	14,512,052
SOUTH FLORIDA	5,157,717	4,270,484	4,331,802
TALLAHASSEE	11,089,303	8,697,941	8,061,934
VALENCIA	24,048,844	21,581,565	20,168,877
TOTAL	\$525,394,590	\$482,293,510	\$463,980,929
INSTITUTION	1983/84	1982/83	1981/82
BREVARD	\$21,714,771	\$19,915,147	\$17,947,141
BROWARD	32,174,186	32,448,333	28,195,693
CENTRAL FLORIDA	7,849,205	7,339,237	7,414,439
CHIPOLA	3,826,196	3,674,191	3,405,819
DAYTONA BEACH	19,524,122	18,265,955	17,856,072
EDISON	8,540,844	6,968,445	6,536,794
FLA CC AT JAX	40,119,328	37,639,142	35,719,249
FLORIDA KEYS	3,573,023	3,132,467	3,148,225
GULF COAST	6,788,410	6,084,398	5,762,064
HILLSBOROUGH	19,302,519	17,444,765	16,240,045
INDIAN RIVER	12,936,167	11,302,776	11,923,917
LAKE CITY	6,695,651	6,453,066	6,108,130
LAKE-SUMTER	3,672,592	3,453,456	3,236,249
MANATEE	10,150,648	8,910,298	8,029,366
MIAMI-DADE	84,604,625	79,099,314	77,227,034
NORTH FLORIDA	2,470,157	2,559,546	2,572,437
OKALOOSA-WALTON	6,599,170	6,159,677	6,031,077
PALM BEACH	18,840,095	17,467,896	14,244,816
PASCO-HERNANDO	4,967,172	4,635,226	4,694,915
PENSACOLA	23,517,840	22,450,123	20,559,491
POLK	8,506,315	8,148,426	7,431,141
ST. JOHNS RIVER	3,278,632	3,098,268	2,918,399
ST. PETERSBURG	27,900,335	24,759,518	23,972,613
SANTA FE	18,016,856	16,204,490	16,269,450

Table A-2 (cont.)

INSTITUTION	1983/84	1982/83	1981/82
SEMINOLE	14,431,034	13,091,061	11,801,968
SOUTH FLORIDA	3,691,414	2,868,087	3,431,991
TALLAHASSEE	8,105,877	6,655,448	6,202,245
VALENCIA	18,837,453	17,845,722	16,780,067
TOTAL	\$440,634,637	\$408,074,476	\$385,669,848
INSTITUTION	1980/81		
BREVARD	\$16,648,626		
BROWARD	23,245,678		
CENTRAL FLORIDA	6,466,726		
CHIPOLA	2,869,693		
DAYTONA BEACH	15,525,096		
EDISON	5,566,010		
FLA CC AT JAX	32,354,374		
FLORIDA KEYS	2,919,282		
GULF COAST	5,525,791		
HILLSBOROUGH	15,413,072		
INDIAN RIVER	9,846,714		
LAKE CITY	5,589,157		
LAKE-SUMTER	2,855,466		
MANATEE	7,022,910		
MIAMI-DADE	69,234,644		
NORTH FLORIDA	2,135,001		
OKALOOSA-WALTON	5,343,657		
PALM BEACH	12,617,783		
PASCO-HERNANDO	4,116,821		
PENSACOLA	18,077,028		
POLK	6,848,561		
ST. JOHNS RIVER	2,694,650		
ST. PETERSBURG	21,551,353		
SANTA FE	14,304,835		
SEMINOLE	10,246,758		
SOUTH FLORIDA	2,263,026		
TALLAHASSEE	4,926,612		
VALENCIA	14,119,325		
TOTAL	\$340,328,649		

Table A-3

State of Florida Community Colleges General Current Fund Total Revenues for Fiscal Years 1980-81 through 1989-90

INSTITUTION	1989/90	1988/89	1987/88
BREVARD	\$35,849,427	\$32,395,988	\$28,351,410
BROWARD	52,212,446	48,851,902	42,279,951
CENTRAL FLORIDA	13,436,046	11,518,076	9,957,149
CHIPOLA	7,087,683	6,384,397	5,307,885
DAYTONA BEACH	31,658,565	29,370,015	25,949,246
EDISON	15,550,994	13,655,503	11,890,535
FLA CC AT JAX	59,943,127	54,496,873	50,252,871
FLORIDA KEYS	5,155,513	4,881,182	4,541,362
GULF COAST	12,529,145	10,873,896	9,531,423
HILLSBOROUGH	33,849,710	29,241,306	26,732,619
INDIAN RIVER	23,199,511	20,112,582	17,533,853
LAKE CITY	10,606,808	9,653,164	8,299,083
LAKE-SUMTER	5,824,397	5,528,579	4,768,696
MANATEE	17,188,900	15,465,308	13,443,951
MIAMI-DADE	142,439,016	125,757,709	113,985,495
NORTH FLORIDA	5,012,785	4,138,720	3,686,094
OKALOOSA-WALTON	11,348,782	10,210,668	8,637,877
PALM BEACH	33,347,426	28,970,278	26,179,739
PASCO-HERNANDO	9,262,363	7,738,638	6,642,255
PENSACOLA	33,176,323	31,126,630	28,647,108
POLK	13,201,550	12,199,284	10,684,806
ST. JOHNS RIVER	6,655,319	5,689,703	4,563,957
ST. PETERSBURG	43,364,309	39,292,420	35,309,835
SANTA FE	30,588,332	27,125,769	24,933,738
SEMINOLE	24,626,030	21,804,519	18,655,485
SOUTH FLORIDA	8,865,214	7,338,715	5,784,360
TALLAHASSEE	18,951,645	15,548,264	12,940,552
VALENCIA	37,598,382	33,082,507	28,132,440
TOTAL	\$742,529,748	\$662,452,595	\$587,623,775
INSTITUTION	1986/87	1985/86	1984/85
BREVARD	\$26,320,444	\$23,953,041	\$23,654,487
BROWARD	38,221,004	35,390,300	33,457,150
CENTRAL FLORIDA	8,827,343	8,500,510	8,349,114
CHIPOLA	4,715,202	4,348,836	4,131,754
DAYTONA BEACH	23,388,646	20,373,449	19,977,602
EDISON	10,569,008	9,229,646	8,677,200
FLA CC AT JAX	45,622,404	42,391,602	42,755,514
FLORIDA KEYS	4,123,710	3,855,319	3,694,547
GULF COAST	8,431,426	7,724,261	7,359,356
HILLSBOROUGH	24,111,944	21,769,973	20,729,450

Table A-3 (cont.)

INSTITUTION	1986/87	1985/86	1984/85
INDIAN RIVER	15,989,036	14,198,029	13,580,230
LAKE CITY	7,595,032	7,720,094	7,296,024
LAKE-SUMTER	4,426,234	4,035,790	3,969,814
MANATEE	12,152,897	10,730,903	10,060,094
MIAMI-DADE	102,007,354	92,532,232	87,004,032
NORTH FLORIDA	3,255,918	2,977,760	2,758,278
OKALOOSA-WALTON	7,924,759	7,539,876	7,027,010
PALM BEACH	22,930,763	20,082,044	18,733,598
PASCO-HERNANDO	5,924,168	5,399,164	5,183,597
PENSACOLA	25,976,566	25,005,811	24,351,406
POLK	9,631,520	9,031,105	8,479,729
ST. JOHNS RIVER	4,218,997	3,686,160	3,495,959
ST. PETERSBURG	32,337,464	29,898,729	28,529,361
SANTA FE	22,356,578	20,189,227	18,731,173
SEMINOLE	16,673,886	14,372,556	13,921,986
SOUTH FLORIDA	5,033,417	4,258,516	4,096,574
TALLAHASSEE	10,932,120	8,890,464	8,351,840
VALENCIA	24,056,665	21,506,288	20,145,968
TOTAL	\$527,754,495	\$479,591,685	\$458,502,847
INSTITUTION	1983/84	1982/83	1981/82
BREVARD	\$22,590,209	\$20,157,091	\$17,876,221
BROWARD	33,023,207	30,400,427	28,216,709
CENTRAL FLORIDA	7,901,507	7,112,729	7,276,101
CHIPOLA	3,944,516	3,567,122	3,517,055
DAYTONA BEACH	19,445,235	18,036,360	17,664,644
EDISON	8,332,763	7,385,223	6,610,816
FLA CC AT JAX	41,188,431	37,520,118	36,374,621
FLORIDA KEYS	3,484,707	3,236,350	3,117,152
GULF COAST	7,120,834	6,274,012	5,905,207
HILLSBOROUGH	20,012,958	17,504,181	16,553,153
INDIAN RIVER	12,933,214	11,598,501	12,089,177
LAKE CITY	7,019,959	6,299,940	6,263,508
LAKE-SUMTER	3,697,659	3,473,217	3,370,209
MANATEE	9,864,257	8,845,172	8,493,133
MIAMI-DADE	83,024,759	77,623,005	76,652,076
NORTH FLORIDA	2,664,700	2,468,992	2,381,963
OKALOOSA-WALTON	6,838,434	6,111,466	5,839,154
PALM BEACH	18,309,248	17,201,575	15,019,689
PASCO-HERNANDO	5,124,042	4,945,502	4,719,473
PENSACOLA	23,856,096	21,898,973	21,435,531
POLK	8,581,216	7,677,292	7,577,986
ST. JOHNS RIVER	3,216,763	2,978,035	2,917,260
ST. PETERSBURG	27,469,968	24,713,999	24,399,824
SANTA FE	17,876,669	16,593,523	16,161,218

Table A-3 (cont.)

INSTITUTION	1983/84	1982/83	1981/82
SEMINOLE	13,714,763	12,970,939	11,825,235
SOUTH FLORIDA	3,585,179	3,234,011	3,224,342
TALLAHASSEE	7,885,736	6,892,718	6,053,489
VALENCIA	19,006,396	17,610,365	16,298,990
TOTAL	\$441,713,425	\$404,330,838	\$387,833,936
<hr/>			
INSTITUTION	1980/81		
BREVARD	\$15,816,470		
BROWARD	23,757,760		
CENTRAL FLORIDA	6,392,595		
CHIPOLA	3,077,858		
DAYTONA BEACH	15,925,280		
EDISON	5,554,611		
FLA CC AT JAX	32,749,925		
FLORIDA KEYS	2,761,927		
GULF COAST	5,467,788		
HILLSBOROUGH	15,035,636		
INDIAN RIVER	9,965,969		
LAKE CITY	5,510,172		
LAKE-SUMTER	2,845,999		
MANATEE	7,220,655		
MIAMI-DADE	69,177,863		
NORTH FLORIDA	2,142,094		
OKALOOSA-WALTON	5,254,420		
PALM BEACH	12,468,534		
PASCO-HERNANDO	4,052,375		
PENSACOLA	18,929,728		
POLK	6,948,553		
ST. JOHNS RIVER	2,615,080		
ST. PETERSBURG	21,226,320		
SANTA FE	13,998,558		
SEMINOLE	10,167,075		
SOUTH FLORIDA	2,639,266		
TALLAHASSEE	5,072,521		
VALENCIA	13,861,580		
TOTAL	\$340,636,612		

Table A-4

State of Florida Community College Program Fund Revenues for
Fiscal Years 1980-81 through 1989-90

INSTITUTION	1989/90	1988/89	1987/88
BREVARD	\$23,971,101	\$22,755,032	\$20,920,147
BROWARD	30,157,157	29,615,427	27,794,044
CENTRAL FLORIDA	8,668,037	8,006,575	7,469,077
CHIPOLA	4,978,958	4,716,120	4,317,144
DAYTONA BEACH	21,387,013	21,070,196	19,226,300
EDISON	9,457,152	8,873,110	7,869,719
FLA CC AT JAX	41,181,367	40,948,604	38,603,966
FLORIDA KEYS	3,486,576	3,460,560	3,277,316
GULF COAST	8,147,900	7,563,097	6,681,789
HILLSBOROUGH	21,257,148	19,768,406	18,566,697
INDIAN RIVER	15,533,761	13,747,917	13,201,794
LAKE CITY	7,666,237	7,614,159	6,555,500
LAKE-SUMTER	4,050,830	4,025,334	3,709,740
MANATEE	11,201,760	10,410,636	9,364,438
MIAMI-DADE	87,581,273	83,113,350	78,084,015
NORTH FLORIDA	3,394,750	3,268,744	2,916,709
OKALOOSA-WALTON	7,349,745	7,181,287	6,510,756
PALM BEACH	20,321,495	19,084,801	16,870,578
PASCO-HERNANDO	5,708,590	5,092,343	4,776,864
PENSACOLA	23,709,715	23,529,958	22,186,116
POLK	8,211,124	8,058,566	7,522,103
ST. JOHNS RIVER	4,695,684	4,203,763	3,568,352
ST. PETERSBURG	27,461,032	26,817,423	25,108,884
SANTA FE	20,023,496	18,955,783	17,327,851
SEMINOLE	16,923,516	15,929,936	14,162,594
SOUTH FLORIDA	6,175,360	5,739,977	4,695,475
TALLAHASSEE	11,562,264	10,265,139	8,823,775
VALENCIA	23,035,574	21,346,300	18,907,125
TOTAL	\$477,298,615	\$455,162,543	\$419,018,868
INSTITUTION	1986/87	1985/86	1984/85
BREVARD	\$19,399,679	\$18,243,999	\$17,516,997
BROWARD	25,666,123	23,588,913	21,241,955
CENTRAL FLORIDA	6,947,705	6,631,081	6,262,202
CHIPOLA	3,822,909	3,535,407	3,232,695
DAYTONA BEACH	17,502,761	15,743,739	14,961,188
EDISON	7,140,949	6,325,088	5,688,152
FLA CC AT JAX	35,842,686	34,468,347	32,433,211
FLORIDA KEYS	3,142,367	2,940,367	2,692,371
GULF COAST	6,172,253	5,637,658	5,115,777
HILLSBOROUGH	17,144,317	15,561,681	14,230,329

Table A-4 (cont.)

INSTITUTION	1986/87	1985/86	1984/85
INDIAN RIVER	12,201,179	10,854,982	10,237,617
LAKE CITY	6,131,485	5,621,701	5,155,206
LAKE-SUMTER	3,466,876	3,113,784	2,852,753
MANATEE	8,564,418	7,482,399	6,785,836
MIAMI-DADE	71,739,889	65,450,451	59,503,452
NORTH FLORIDA	2,617,682	2,434,895	2,234,010
OKALOOSA-WALTON	6,031,426	5,558,391	5,133,867
PALM BEACH	15,559,877	13,686,791	12,784,750
PASCO-HERNANDO	4,368,628	3,995,346	3,738,545
PENSACOLA	20,598,302	20,204,048	18,872,744
POLK	6,811,277	6,379,768	5,900,255
ST. JOHNS RIVER	3,132,399	2,777,686	2,529,356
ST. PETERSBURG	23,158,892	20,892,248	19,039,657
SANTA FE	16,117,643	14,755,938	13,387,756
SEMINOLE	13,127,581	11,488,363	10,492,459
SOUTH FLORIDA	4,025,728	3,351,188	3,108,039
TALLAHASSEE	7,531,242	6,088,810	5,665,707
VALENCIA	16,914,390	15,270,329	13,621,176
TOTAL	\$384,880,663	\$352,083,398	\$324,418,062
INSTITUTION	1983/84	1982/83	1981/82
BREVARD	\$16,155,948	\$14,910,125	\$12,849,011
BROWARD	20,052,540	18,220,190	17,651,217
CENTRAL FLORIDA	5,960,831	5,556,647	5,459,302
CHIPOLA	3,034,411	2,841,710	2,795,896
DAYTONA BEACH	13,936,790	12,982,626	12,753,209
EDISON	5,094,264	4,728,287	4,446,263
FLA CC AT JAX	30,781,516	28,812,822	28,191,893
FLORIDA KEYS	2,552,607	2,379,558	2,292,408
GULF COAST	4,844,550	4,380,723	4,182,917
HILLSBOROUGH	13,178,956	12,223,221	11,964,212
INDIAN RIVER	9,658,981	8,691,224	8,536,583
LAKE CITY	5,136,543	4,824,264	4,747,850
LAKE-SUMTER	2,715,999	2,528,259	2,488,172
MANATEE	6,148,328	5,698,449	5,576,066
MIAMI-DADE	55,622,911	51,480,544	50,424,228
NORTH FLORIDA	2,132,068	2,000,686	1,970,212
OKALOOSA-WALTON	4,905,575	4,567,140	4,269,723
PALM BEACH	11,733,256	10,857,472	10,055,486
PASCO-HERNANDO	3,680,739	3,417,659	3,343,373
PENSACOLA	17,943,507	16,786,575	16,358,533
POLK	5,685,263	5,280,730	5,167,616
ST. JOHNS RIVER	2,469,824	2,307,528	2,232,570
ST. PETERSBURG	18,016,595	16,667,061	16,305,399
SANTA FE	12,413,006	11,534,441	11,328,882

Table A-4 (cont.)

INSTITUTION	1983/84	1982/83	1981/82
SEMINOLE	10,416,776	9,741,818	8,994,766
SOUTH FLORIDA	2,881,707	2,709,515	2,665,423
TALLAHASSEE	5,396,019	4,887,365	3,921,760
VALENCIA	12,888,259	12,014,389	10,771,374
TOTAL	\$305,437,769	\$283,031,028	\$271,744,344
INSTITUTION	1980/81		
BREVARD	\$11,434,454		
BROWARD	15,154,188		
CENTRAL FLORIDA	4,992,506		
CHIPOLA	2,417,385		
DAYTONA BEACH	11,444,115		
EDISON	3,853,259		
FLA CC AT JAX	25,781,355		
FLORIDA KEYS	1,973,858		
GULF COAST	3,825,258		
HILLSBOROUGH	10,857,635		
INDIAN RIVER	7,806,665		
LAKE CITY	4,219,952		
LAKE-SUMTER	2,152,637		
MANATEE	4,688,189		
MIAMI-DADE	46,112,724		
NORTH FLORIDA	1,801,750		
OKALOOSA-WALTON	3,875,391		
PALM BEACH	8,418,995		
PASCO-HERNANDO	2,793,528		
PENSACOLA	14,959,802		
POLK	4,725,761		
ST. JOHNS RIVER	1,988,721		
ST. PETERSBURG	14,165,411		
SANTA FE	10,040,270		
SEMINOLE	7,689,225		
SOUTH FLORIDA	2,142,327		
TALLAHASSEE	3,369,306		
VALENCIA	9,232,787		
TOTAL	\$241,917,454		

Table A-5

State of Florida Community Colleges Student Fee Revenues for
Fiscal Years 1980-81 through 1989-90

INSTITUTION	1989/90	1988/89	1987/88
BREVARD	\$6,855,704	\$6,200,963	\$5,409,418
BROWARD	12,694,041	11,376,804	10,080,883
CENTRAL FLORIDA	2,953,798	2,470,874	1,995,306
CHIPOLA	1,003,934	916,295	752,108
DAYTONA BEACH	6,142,888	5,623,350	5,345,196
EDISON	3,722,187	3,199,320	2,923,128
FLA CC AT JAX	10,308,441	8,754,706	7,791,978
FLORIDA KEYS	941,292	815,426	735,402
GULF COAST	2,364,358	2,194,408	2,086,222
HILLSBOROUGH	8,386,022	7,185,031	6,418,922
INDIAN RIVER	3,804,626	3,723,920	3,424,034
LAKE CITY	1,534,168	1,297,446	1,233,765
LAKE-SUMTER	1,046,302	922,220	832,353
MANATEE	4,171,531	3,923,107	3,413,153
MIAMI-DADE	35,851,547	31,804,932	29,288,412
NORTH FLORIDA	537,874	464,947	451,623
OKALOOSA-WALTON	2,321,863	2,054,727	1,620,257
PALM BEACH	8,459,461	7,254,239	6,713,559
PASCO-HERNANDO	2,305,028	1,861,388	1,544,992
PENSACOLA	5,217,360	5,004,229	4,801,814
POLK	3,286,347	2,890,922	2,390,794
ST. JOHNS RIVER	1,224,360	996,357	811,990
ST. PETERSBURG	10,389,770	9,436,442	8,661,918
SANTA FE	6,638,470	5,779,115	5,628,461
SEMINOLE	4,284,700	3,609,125	3,227,106
SOUTH FLORIDA	1,122,909	908,219	834,200
TALLAHASSEE	4,457,245	3,746,707	3,256,596
VALENCIA	9,775,057	8,780,632	7,297,834
TOTAL	\$161,801,283	\$143,195,851	\$128,971,424
INSTITUTION	1986/87	1985/86	1984/85
BREVARD	\$5,083,955	\$4,460,147	\$4,477,735
BROWARD	9,894,544	9,584,386	9,223,830
CENTRAL FLORIDA	1,568,787	1,435,409	1,351,712
CHIPOLA	704,813	667,931	624,495
DAYTONA BEACH	5,043,784	3,928,621	3,793,666
EDISON	2,557,315	2,254,466	2,198,379
FLA CC AT JAX	6,647,519	5,720,446	5,858,404
FLORIDA KEYS	666,687	602,167	617,163
GULF COAST	1,769,203	1,682,300	1,604,578
HILLSBOROUGH	6,055,734	5,380,393	4,988,866

Table A-5 (cont.)

INSTITUTION	1986/87	1985/86	1984/85
INDIAN RIVER	3,368,079	2,949,995	2,892,197
LAKE CITY	1,223,202	991,076	1,156,417
LAKE-SUMTER	737,146	720,406	630,893
MANATEE	3,066,882	2,812,494	2,697,916
MIAMI-DADE	27,017,938	24,477,814	23,591,099
NORTH FLORIDA	431,152	369,577	358,462
OKALOOSA-WALTON	1,419,444	1,404,089	1,355,504
PALM BEACH	6,155,321	5,666,811	5,014,011
PASCO-HERNANDO	1,329,246	1,220,555	1,096,840
PENSACOLA	4,596,174	3,917,208	3,961,233
POLK	2,017,632	1,985,576	1,976,266
ST. JOHNS RIVER	714,767	607,283	548,771
ST. PETERSBURG	8,011,306	7,946,652	7,761,279
SANTA FE	4,916,831	4,593,616	4,175,443
SEMINOLE	2,963,884	2,380,772	2,468,223
SOUTH FLORIDA	775,848	611,118	618,242
TALLAHASSEE	2,689,800	2,200,248	2,072,913
VALENCIA	6,127,041	5,588,343	5,190,181
TOTAL	\$117,554,034	\$106,159,899	\$102,304,718
INSTITUTION	1983/84	1982/83	1981/82
BREVARD	\$4,686,472	\$4,484,153	\$4,234,806
BROWARD	9,318,056	8,930,806	7,822,671
CENTRAL FLORIDA	1,500,667	1,389,515	1,504,845
CHIPOLA	594,949	553,760	545,968
DAYTONA BEACH	4,067,927	4,095,236	3,757,210
EDISON	2,242,064	2,068,013	1,857,184
FLA CC AT JAX	6,073,628	6,078,030	5,658,161
FLORIDA KEYS	632,976	676,743	651,448
GULF COAST	1,570,629	1,545,672	1,423,642
HILLSBOROUGH	5,296,448	4,616,763	3,980,700
INDIAN RIVER	2,482,580	2,534,979	2,148,438
LAKE CITY	1,077,564	1,337,140	1,308,440
LAKE-SUMTER	675,355	799,009	719,372
MANATEE	2,941,493	2,699,070	2,352,131
MIAMI-DADE	22,160,846	23,539,666	22,619,717
NORTH FLORIDA	260,246	278,372	276,847
OKALOOSA-WALTON	1,412,091	1,412,727	1,341,761
PALM BEACH	4,906,430	4,656,357	3,931,603
PASCO-HERNANDO	1,125,954	1,334,563	1,241,462
PENSACOLA	4,073,927	4,109,944	3,772,990
POLK	2,156,882	2,101,984	1,963,951
ST. JOHNS RIVER	570,411	573,419	537,782
ST. PETERSBURG	7,418,224	7,317,053	6,873,354
SANTA FE	4,162,448	4,434,346	4,200,382

Table A-5 (cont.)

INSTITUTION	1983/84	1982/83	1981/82
SEMINOLE	2,357,093	2,369,326	2,176,733
SOUTH FLORIDA	396,034	354,279	357,024
TALLAHASSEE	1,875,932	1,711,410	1,553,241
VALENCIA	4,959,142	5,024,083	4,792,508
TOTAL	\$100,996,468	\$101,026,418	\$93,604,371
INSTITUTION	1980/81		
BREVARD	\$3,858,507		
BROWARD	6,932,885		
CENTRAL FLORIDA	1,164,650		
CHIPOLA	513,764		
DAYTONA BEACH	3,447,207		
EDISON	1,488,458		
FLA CC AT JAX	5,299,385		
FLORIDA KEYS	613,761		
GULF COAST	1,353,686		
HILLSBOROUGH	3,832,386		
INDIAN RIVER	1,808,948		
LAKE CITY	1,241,128		
LAKE-SUMTER	606,741		
MANATEE	2,237,219		
MIAMI-DADE	20,636,152		
NORTH FLORIDA	250,532		
OKALOOSA-WALTON	1,239,757		
PALM BEACH	3,454,394		
PASCO-HERNANDO	1,125,641		
PENSACOLA	3,313,254		
POLK	1,815,272		
ST. JOHNS RIVER	511,393		
ST. PETERSBURG	6,352,997		
SANTA FE	3,471,999		
SEMINOLE	2,084,208		
SOUTH FLORIDA	328,439		
TALLAHASSEE	1,161,817		
VALENCIA	4,127,509		
TOTAL	\$84,272,089		

Table A-6

State of Florida Community Colleges State Other Revenues for
Fiscal Years 1980-81 through 1989-90

INSTITUTION	1989/90	1988/89	1987/88
BREVARD	\$4,098,582	\$2,451,236	\$1,052,463
BROWARD	7,022,556	5,734,230	2,484,176
CENTRAL FLORIDA	1,230,279	599,143	232,514
CHIPOLA	799,380	350,030	122,882
DAYTONA BEACH	3,246,434	1,885,904	784,439
EDISON	1,387,171	693,077	313,415
FLA CC AT JAX	7,157,345	3,533,002	1,851,149
FLORIDA KEYS	454,162	346,687	306,464
GULF COAST	1,562,344	780,464	569,915
HILLSBOROUGH	3,616,552	1,792,775	1,315,436
INDIAN RIVER	3,199,405	2,227,460	610,103
LAKE CITY	1,220,362	590,777	428,150
LAKE-SUMTER	550,516	426,446	113,607
MANATEE	1,551,636	835,711	471,421
MIAMI-DADE	15,159,045	6,904,326	3,852,982
NORTH FLORIDA	909,423	267,750	223,196
OKALOOSA-WALTON	1,517,671	803,918	369,907
PALM BEACH	3,477,113	1,617,141	1,790,071
PASCO-HERNANDO	1,054,854	623,657	217,453
PENSACOLA	3,411,226	1,891,515	1,051,691
POLK	1,265,511	778,773	340,712
ST. JOHNS RIVER	616,427	378,568	108,453
ST. PETERSBURG	4,407,591	2,075,040	967,032
SANTA FE	3,339,559	1,853,236	1,492,165
SEMINOLE	2,757,976	1,703,786	794,714
SOUTH FLORIDA	1,039,007	529,606	162,288
TALLAHASSEE	2,242,646	955,647	420,451
VALENCIA	3,675,280	1,894,836	1,206,570
TOTAL	\$81,970,053	\$44,524,741	\$23,653,819
INSTITUTION	1986/87	1985/86	1984/85
BREVARD	\$814,088	\$341,177	\$385,077
BROWARD	812,921	390,578	1,207,591
CENTRAL FLORIDA	114,703	204,875	233,755
CHIPOLA	86,559	47,297	123,725
DAYTONA BEACH	320,760	191,917	606,057
EDISON	87,962	43,837	170,948
FLA CC AT JAX	1,069,998	644,042	2,609,904
FLORIDA KEYS	127,143	98,436	171,653
GULF COAST	259,015	226,257	348,691
HILLSBOROUGH	546,844	400,398	992,581

Table A-6 (cont.)

INSTITUTION	1986/87	1985/86	1984/85
INDIAN RIVER	203,115	121,851	129,461
LAKE CITY	141,757	990,423	613,893
LAKE-SUMTER	118,192	102,467	378,471
MANATEE	332,453	201,774	327,497
MIAMI-DADE	1,390,033	741,224	2,059,986
NORTH FLORIDA	122,518	106,580	87,295
OKALOOSA-WALTON	354,825	431,123	395,869
PALM BEACH	508,117	215,424	263,159
PASCO-HERNANDO	149,629	116,453	253,072
PENSACOLA	323,771	356,195	792,638
POLK	413,440	158,641	220,099
ST. JOHNS RIVER	269,772	231,881	314,831
ST. PETERSBURG	627,633	486,087	1,071,953
SANTA FE	490,615	301,613	669,719
SEMINOLE	254,816	115,501	566,954
SOUTH FLORIDA	147,625	95,221	191,659
TALLAHASSEE	442,758	246,368	361,971
VALENCIA	485,686	237,856	890,303
TOTAL	\$11,016,748	\$7,845,496	\$16,438,812
INSTITUTION	1983/84	1982/83	1981/82
BREVARD	\$823,367	\$135,955	\$209,813
BROWARD	1,580,273	967,311	371,038
CENTRAL FLORIDA	291,234	31,881	132,081
CHIPOLA	133,264	10,895	34,885
DAYTONA BEACH	739,432	134,662	261,896
EDISON	274,927	94,273	95,500
FLA CC AT JAX	2,678,558	935,927	588,910
FLORIDA KEYS	131,685	16,833	33,727
GULF COAST	487,517	84,257	132,223
HILLSBOROUGH	1,128,984	320,191	271,116
INDIAN RIVER	454,667	55,249	1,104,051
LAKE CITY	660,241	9,605	53,393
LAKE-SUMTER	193,226	26,034	26,505
MANATEE	516,247	154,353	220,149
MIAMI-DADE	3,421,500	627,017	1,142,067
NORTH FLORIDA	90,342	7,386	19,579
OKALOOSA-WALTON	443,957	61,265	108,645
PALM BEACH	946,873	1,003,600	330,922
PASCO-HERNANDO	229,917	42,532	59,658
PENSACOLA	1,120,215	227,896	378,232
POLK	445,076	46,358	90,731
ST. JOHNS RIVER	133,628	21,723	34,690
ST. PETERSBURG	1,348,793	165,170	340,671
SANTA FE	832,010	217,659	168,217

Table A-6 (cont.)

INSTITUTION	1983/84	1982/83	1981/82
SEMINOLE	551,878	482,315	180,733
SOUTH FLORIDA	144,391	41,401	65,627
TALLAHASSEE	358,245	113,641	274,233
VALENCIA	777,679	197,394	190,890
TOTAL	\$20,938,126	\$6,232,783	\$6,920,182
INSTITUTION	1980/81		
BREVARD	\$5,266		
BROWARD	11,923		
CENTRAL FLORIDA	53,495		
CHIPOLA	22,144		
DAYTONA BEACH	205,635		
EDISON	62,685		
FLA CC AT JAX	21,048		
FLORIDA KEYS	16,197		
GULF COAST	81,048		
HILLSBOROUGH	4,940		
INDIAN RIVER	84,387		
LAKE CITY	1,901		
LAKE-SUMTER	3,890		
MANATEE	85,906		
MIAMI-DADE	288,402		
NORTH FLORIDA	13,501		
OKALOOSA-WALTON	12,882		
PALM BEACH	3,863		
PASCO-HERNANDO	31,850		
PENSACOLA	46,726		
POLK	53,685		
ST. JOHNS RIVER	748		
ST. PETERSBURG	7,771		
SANTA FE	11,399		
SEMINOLE	0		
SOUTH FLORIDA	51,882		
TALLAHASSEE	317,420		
VALENCIA	14,637		
TOTAL	\$1,515,231		

Table A-7

State of Florida Community Colleges Local Other Revenues for
Fiscal Years 1980-81 through 1989-90

INSTITUTION	1989/90	1988/89	1987/88
BREVARD	\$884,777	\$955,314	\$822,423
BROWARD	2,318,808	2,110,233	1,911,272
CENTRAL FLORIDA	583,932	441,484	259,329
CHIPOLA	177,776	401,952	115,751
DAYTONA BEACH	844,927	748,957	547,985
EDISON	975,719	884,175	783,273
FLA CC AT JAX	1,114,410	1,195,586	1,920,323
FLORIDA KEYS	264,123	249,574	215,616
GULF COAST	438,885	321,680	180,427
HILLSBOROUGH	569,498	470,603	409,585
INDIAN RIVER	635,697	394,301	282,131
LAKE CITY	178,427	143,447	59,905
LAKE-SUMTER	170,765	149,198	106,759
MANATEE	248,696	274,303	171,930
MIAMI-DADE	3,437,130	3,607,421	2,444,008
NORTH FLORIDA	170,738	137,279	94,566
OKALOOSA-WALTON	152,971	166,206	134,209
PALM BEACH	1,084,072	1,009,307	801,771
PASCO-HERNANDO	186,193	147,360	102,946
PENSACOLA	769,423	627,329	507,982
POLK	433,422	463,634	427,513
ST. JOHNS RIVER	115,205	109,683	74,044
ST. PETERSBURG	1,069,093	924,052	543,780
SANTA FE	507,482	479,738	422,920
SEMINOLE	638,250	555,927	454,337
SOUTH FLORIDA	527,938	160,913	92,204
TALLAHASSEE	678,517	572,228	430,218
VALENCIA	990,519	966,251	686,137
TOTAL	\$20,167,393	\$18,668,135	\$15,003,344
INSTITUTION	1986/87	1985/86	1984/85
BREVARD	\$989,908	\$837,534	\$1,221,429
BROWARD	1,830,548	1,811,981	1,764,571
CENTRAL FLORIDA	192,660	226,865	477,855
CHIPOLA	100,921	98,201	130,839
DAYTONA BEACH	492,518	464,151	590,700
EDISON	781,378	605,242	618,575
FLA CC AT JAX	1,998,839	1,481,556	1,670,117
FLORIDA KEYS	176,460	205,579	195,932
GULF COAST	206,645	164,029	276,998
HILLSBOROUGH	340,033	402,635	490,272

Table A-7 (cont.)

INSTITUTION	1986/87	1985/86	1984/85
INDIAN RIVER	205,909	260,341	310,284
LAKE CITY	87,072	93,371	363,227
LAKE-SUMTER	102,733	93,681	93,379
MANATEE	146,445	187,471	225,194
MIAMI-DADE	1,524,731	1,426,982	1,563,458
NORTH FLORIDA	84,566	66,708	78,511
OKALOOSA-WALTON	116,649	143,415	140,273
PALM BEACH	704,028	509,218	667,658
PASCO-HERNANDO	76,665	63,328	95,140
PENSACOLA	440,542	515,643	716,196
POLK	380,516	497,443	378,893
ST. JOHNS RIVER	100,713	68,007	101,694
ST. PETERSBURG	511,708	522,330	609,237
SANTA FE	737,052	368,069	321,847
SEMINOLE	308,357	345,573	373,060
SOUTH FLORIDA	77,320	89,186	104,945
TALLAHASSEE	260,674	261,660	244,677
VALENCIA	474,566	394,725	356,362
TOTAL	\$13,450,156	\$12,204,924	\$14,181,323
INSTITUTION	1983/84	1982/83	1981/82
BREVARD	\$864,155	\$590,579	\$563,859
BROWARD	2,051,002	2,275,472	2,367,600
CENTRAL FLORIDA	148,775	132,320	177,365
CHIPOLA	161,892	140,757	121,331
DAYTONA BEACH	658,068	790,545	867,432
EDISON	721,508	492,471	205,522
FLA CC AT JAX	1,566,950	1,494,730	1,769,020
FLORIDA KEYS	157,656	150,827	123,052
GULF COAST	196,987	248,011	159,324
HILLSBOROUGH	375,111	323,028	319,536
INDIAN RIVER	324,014	305,235	288,912
LAKE CITY	145,611	128,931	153,825
LAKE-SUMTER	107,348	109,123	126,786
MANATEE	244,103	289,004	335,210
MIAMI-DADE	1,462,913	1,666,667	2,058,860
NORTH FLORIDA	179,260	182,073	114,232
OKALOOSA-WALTON	72,971	68,247	117,171
PALM BEACH	714,754	684,146	701,678
PASCO-HERNANDO	86,004	147,289	64,876
PENSACOLA	714,368	774,558	925,775
POLK	286,676	242,905	337,486
ST. JOHNS RIVER	41,494	74,077	110,942
ST. PETERSBURG	634,037	518,964	850,484
SANTA FE	281,888	273,753	309,684

Table A-7 (cont.)

INSTITUTION	1983/84	1982/83	1981/82
SEMINOLE	364,972	356,449	460,242
SOUTH FLORIDA	136,011	108,076	135,824
TALLAHASSEE	246,388	177,019	214,165
VALENCIA	317,711	332,801	500,705
TOTAL	\$13,262,627	\$13,078,057	\$14,480,898
INSTITUTION	1980/81		
BREVARD	\$483,256		
BROWARD	1,632,935		
CENTRAL FLORIDA	178,821		
CHIPOLA	108,315		
DAYTONA BEACH	780,081		
EDISON	146,411		
FLA CC AT JAX	1,497,699		
FLORIDA KEYS	132,705		
GULF COAST	179,651		
HILLSBOROUGH	294,118		
INDIAN RIVER	227,775		
LAKE CITY	47,191		
LAKE-SUMTER	74,664		
MANATEE	187,071		
MIAMI-DADE	1,590,088		
NORTH FLORIDA	73,490		
OKALOOSA-WALTON	122,329		
PALM BEACH	587,908		
PASCO-HERNANDO	82,540		
PENSACOLA	587,896		
POLK	350,368		
ST. JOHNS RIVER	112,634		
ST. PETERSBURG	645,701		
SANTA FE	270,648		
SEMINOLE	366,196		
SOUTH FLORIDA	77,923		
TALLAHASSEE	131,750		
VALENCIA	416,467		
TOTAL	\$11,386,631		

Table A-8

State of Florida Community Colleges Federal Revenues for
Fiscal Years 1980-81 through 1989-90

INSTITUTION	1989/90	1988/89	1987/88
BREVARD	\$39,263	\$33,443	\$146,959
BROWARD	19,884	15,208	9,576
CENTRAL FLORIDA	0	0	923
CHIPOLA	127,635	0	0
DAYTONA BEACH	37,303	41,608	45,326
EDISON	8,765	5,821	1,000
FLA CC AT JAX	181,564	64,975	85,455
FLORIDA KEYS	9,360	8,935	6,564
GULF COAST	15,658	14,247	13,070
HILLSBOROUGH	20,490	24,491	21,979
INDIAN RIVER	26,022	18,984	15,791
LAKE CITY	7,614	7,335	21,763
LAKE-SUMTER	5,984	5,381	6,237
MANATEE	15,277	21,551	23,009
MIAMI-DADE	410,021	327,680	316,078
NORTH FLORIDA	0	0	0
OKALOOSA-WALTON	6,532	4,530	2,748
PALM BEACH	5,285	4,790	3,760
PASCO-HERNANDO	7,698	13,890	0
PENSACOLA	68,599	73,599	99,505
POLK	5,146	7,389	3,684
ST. JOHNS RIVER	3,643	1,332	1,118
ST. PETERSBURG	36,823	39,463	28,221
SANTA FE	79,325	57,897	62,341
SEMINOLE	21,588	5,745	16,734
SOUTH FLORIDA	0	0	193
TALLAHASSEE	10,973	8,543	9,512
VALENCIA	121,952	94,488	34,774
TOTAL	\$1,292,404	\$901,325	\$976,320
INSTITUTION	1986/87	1985/86	1984/85
BREVARD	\$32,814	\$70,184	\$53,249
BROWARD	16,868	14,442	19,203
CENTRAL FLORIDA	3,488	2,280	23,590
CHIPOLA	0	0	20,000
DAYTONA BEACH	28,823	45,021	25,991
EDISON	1,404	1,013	1,146
FLA CC AT JAX	63,362	77,211	183,878
FLORIDA KEYS	11,053	8,770	17,428
GULF COAST	24,310	14,017	13,312
HILLSBOROUGH	25,016	24,866	27,402

Table A-8 (cont.)

INSTITUTION	1986/87	1985/86	1984/85
INDIAN RIVER	10,754	10,860	10,671
LAKE CITY	11,516	23,523	7,281
LAKE-SUMTER	1,287	5,452	14,318
MANATEE	42,699	46,765	23,651
MIAMI-DADE	334,763	435,761	286,037
NORTH FLORIDA	0	0	0
OKALOOSA-WALTON	2,415	2,858	1,497
PALM BEACH	3,420	3,800	4,020
PASCO-HERNANDO	0	3,482	0
PENSACOLA	17,777	12,717	8,595
POLK	8,655	9,677	4,216
ST. JOHNS RIVER	1,346	1,303	1,307
ST. PETERSBURG	27,925	51,412	47,235
SANTA FE	94,437	169,991	176,408
SEMINOLE	19,248	42,347	21,290
SOUTH FLORIDA	6,896	111,803	73,689
TALLAHASSEE	7,646	93,378	6,572
VALENCIA	54,972	15,035	87,946
TOTAL	\$852,894	\$1,297,968	\$1,159,932
INSTITUTION	1983/84	1982/83	1981/82
BREVARD	\$60,267	\$36,279	\$18,732
BROWARD	21,336	6,648	4,183
CENTRAL FLORIDA	0	2,366	2,508
CHIPOLA	20,000	20,000	18,975
DAYTONA BEACH	43,018	33,291	24,897
EDISON	0	2,179	6,347
FLA CC AT JAX	87,779	198,609	166,637
FLORIDA KEYS	9,783	12,389	16,517
GULF COAST	21,151	15,349	7,101
HILLSBOROUGH	33,459	20,978	17,589
INDIAN RIVER	12,972	11,814	11,193
LAKE CITY	0	0	0
LAKE-SUMTER	5,731	10,792	9,374
MANATEE	14,086	4,296	9,577
MIAMI-DADE	356,589	309,111	407,204
NORTH FLORIDA	2,784	475	1,093
OKALOOSA-WALTON	3,840	2,087	1,854
PALM BEACH	7,935	0	0
PASCO-HERNANDO	1,428	3,459	10,104
PENSACOLA	4,079	0	1
POLK	7,319	5,315	18,202
ST. JOHNS RIVER	1,406	1,288	1,276
ST. PETERSBURG	52,319	45,751	29,916
SANTA FE	187,317	133,324	154,053

Table A-8 (cont.)

INSTITUTION	1983/84	1982/83	1981/82
SEMINOLE	24,044	21,031	12,761
SOUTH FLORIDA	27,036	20,740	444
TALLAHASSEE	9,152	3,283	90,090
VALENCIA	63,605	41,698	43,513
TOTAL	\$1,078,435	\$962,552	\$1,084,141
INSTITUTION	1980/81		
BREVARD	\$34,987		
BROWARD	25,829		
CENTRAL FLORIDA	3,123		
CHIPOLA	16,250		
DAYTONA BEACH	48,242		
EDISON	3,798		
FLA CC AT JAX	150,438		
FLORIDA KEYS	25,406		
GULF COAST	28,145		
HILLSBOROUGH	46,557		
INDIAN RIVER	38,194		
LAKE CITY	0		
LAKE-SUMTER	8,067		
MANATEE	22,270		
MIAMI-DADE	550,497		
NORTH FLORIDA	2,821		
OKALOOSA-WALTON	4,061		
PALM BEACH	3,374		
PASCO-HERNANDO	18,816		
PENSACOLA	22,050		
POLK	3,467		
ST. JOHNS RIVER	1,584		
ST. PETERSBURG	54,440		
SANTA FE	204,242		
SEMINOLE	27,446		
SOUTH FLORIDA	38,695		
TALLAHASSEE	92,228		
VALENCIA	70,180		
TOTAL	\$1,545,207		

APPENDIX B

COMMUNITY COLLEGES USED IN THE STUDY

The following table lists the State of Florida community colleges and the counties served by each institution for the fiscal year periods 1980-81 through 1989-90.

Table B-1

State of Florida Community Colleges and the Counties Served by Each Institution

INSTITUTION	COUNTIES IN DISTRICT
Brevard Community College	Brevard County
Broward Community College	Broward County
Central Florida Community College	Marion County Citrus County Levy County
Chipola Junior College	Jackson County Calhoun County Holmes County Liberty County Washington County
Daytona Beach Community College	Volusia County Flagler County
Edison Community College	Lee County Charlotte County Collier County Glades County Hendry County
Florida Community College At Jacksonville	Duval County Nassau County
Florida Keys Community College	Monroe County

TABLE B-1 (cont.)

INSTITUTION	COUNTIES IN DISTRICT
Gulf Coast Community College	Bay County Franklin County Gulf County
Hillsborough Community College	Hillsborough County
Indian River Community College	St. Lucie County Indian River County Martin County Okeechobee County
Lake City Community College	Columbia County Baker County Dixie County Gilchrist County Union County
Lake-Sumter Community College	Lake County Sumter County
Manatee Community College	Manatee County Sarasota County
Miami-Dade Community College	Dade County
North Florida Junior College	Madison County Hamilton County Jefferson County Lafayette County Suwannee County Taylor County
Okaloosa-Walton Community College	Okaloosa County Walton County
Palm Beach Community College	Palm Beach County
Pasco-Hernando Community College	Hernando County Pasco County
Pensacola Junior College	Escambia County Santa Rosa County
Polk Community College	Polk County

TABLE B-1 (cont.)

INSTITUTION	COUNTIES IN DISTRICT
St. Johns River Community College	Putnam County Clay County St. Johns county
St. Petersburg Junior College	Pinellas County
Santa Fe Community College	Alachua County Bradford County
Seminole Community College	Seminole County
South Florida Community College	Highlands County De Soto County Hardee County
Tallahassee Community College	Leon County Gadsden County Wakulla County
Valencia Community College	Orange County Osceola County

Source: Report For Community Colleges, The Fact Book 1990-91 (State of Florida Bureau of Information Systems, 1991).

APPENDIX C

COMMUNITY COLLEGE PROGRAM FUND

The State of Florida community college foundation funding program was called the Community College Program Funding (CCPF) (Florida Statutes §240.347, 1991). The State of Florida Community College Program Fund and was promulgated in Florida Statutes §240.347 (1989) as follows:

(1) There is established a State Community College Program Fund. This fund shall compromise all appropriations made by the legislature for the support of the current operating program and shall be apportioned and distributed to the community college districts of the state on the basis of procedures established by law and regulations of the State Board of Education and the State Board of Community Colleges. (p. 1797)

During the time period utilized in this study the statute had a change that affected the 1985-87 budget request. The change required the budget request to have certain categories and subcategories. The change did not affect the budget categories used in this study.

The basis of this description of the funding process is personal communication with Ken Jarrett of the Division of Community Colleges and an unpublished document by Ken Jarrett titled Florida State Board of Community Colleges The community College Program Fund (CCPF) A Funding Process. The process was as follows:

1. Base Year Cost Analyses. The first step was establishment of base year raw data. The purpose was to establish the historical expenditure levels of the 28 community colleges by program and type of expenditure. The data sources were specified as the "Cost Analysis Report (CA-2)" and the "Annual Financial Report." These data were categorized into 13 programs and six types of expenditures.

2. Base Year Cost Data. The next step was conversion of the base year raw data to a matrix of ratios by program and type of expenditure. Each institution's matrix was converted to ratios "by dividing the value of each cell [of the matrix] by the value of all cells." The matrix was then converted into a cost matrix "by multiplying each ratio by the sum of the of the current year general appropriation for the Community College Program Fund (CCPF) and student fee revenue." At this stage of the process some categories were expanded based on information in the Annual Financial Report. The result of this process was "a Base Year Data Matrix for each college that reflected its latest expenditure pattern by program and type of expenditure."

3. Cost to Continue. The values in the Base Year Data Matrix were adjusted based on the program emphasis provided by the State Board of Community Colleges to determine the cost to continue appropriation.

4. Workload Adjustments. There were two principle areas covered in workload adjustments. The two areas were enrollment related workload and facilities related workload.

The enrollment workload adjustment was based on the most recognized aspect of community college workload, the enrollment FTE. Florida used a corridor approach for adjusting budget for FTE changes. The average of the current year estimated FTE and the preceding two years actual FTE was compared to the current year "assigned or funded enrollment." If the difference exceeded 5% of the current year value, the college would have been allocated additional funding for the six basic enrollment related budget programs. If the difference was lower than the current year value, the funding was taken from the college over a 2-year period with 50% of the reduction being taken each year.

The second area was new facility workload. New facilities have operation costs that required funding that would not exist in the base funding of the previous year. To accommodate this need a workload adjustment based on gross square footage was added to the current year funding. The adjustment was based on average prior year square foot cost, adjusted for inflation, and prorated for the portion of the year the building would be in service.

During the 1989 legislative session one additional adjustment was recognized that would affect the CCPF base.

Improved and new programs for the 1988-89 fiscal year were allocated through the CCPF and were to become part of the base.

APPENDIX D
EXPENSE/REVENUE RELATIONSHIP

Assumption

There was an assumption made in the study based on Bowen's (1980) observation that education spends all funding that is available in pursuit of the educational mission. The assumption was that revenues closely approximated expenditures and that revenue horizontal equity closely approximated expenditure horizontal equity for the community college system. The assumption was substantiated by examining total revenues, total expenditures, beginning fund balances, fund balance changes, revenue horizontal equity, and expenditure horizontal equity for the 10 fiscal year period covered by this study for the State of Florida community colleges.

The comparison required calculating the per-student (per FTE) revenues and expenditures for each institution for each year of the study. These beginning fund balance, FTE, revenue, and expenditure data were taken from the Report for Florida Community Colleges (State of Florida Department of Education Division of Community Colleges, 1979, 1980, 1981, 1982, 1983, 1984), Report for Florida Community Colleges, Part 1 (State of Florida Department of Education Division of Community Colleges, 1985), Report for Florida Community

Colleges, The Fact Book (State of Florida Department of Education Division of Community Colleges, 1985, 1986, 1987) and the Report for Florida Community Colleges, The Fact Book (State of Florida Bureau of Information Systems, 1988, 1989, 1990, 1991). These raw data are listed in Appendix A, Table A-1 for FTE, Table A-2 for expenditures, and Table A-3 for revenues.

These data were for the General Current Fund budget category for each institution for each year. These data were used to calculate per-student (per-FTE) revenues and expenditures for each institution for each year utilized in the study. The per-student revenues and expenditures were used in the calculation of the six horizontal equity measures: range, restricted range, federal range ratio, coefficient of variation, McLoone index, and Gini coefficient.

Total Expenses Versus Total Revenues

The comparison of the General Current Fund total expenditures and total revenues for the 10 fiscal year periods 1980-81 through 1989-90 is listed in Table D-1. The difference between expenditures and revenues, where expenditures are less than revenues, are indicated by a negative value. The differences between expenses and revenues varied from \$5,478,072 in 1984-85 to -\$11,849,761 in 1988-89. The percent difference in total expenses and

revenues varied between 1.19% in 1984-85 to -1.80% in 1988-89. Seven of the 10 years varied less than or equal to plus or minus 0.56%. Figure D-1 depicts the relationship of the expenses and revenues during the 10-year period. Based

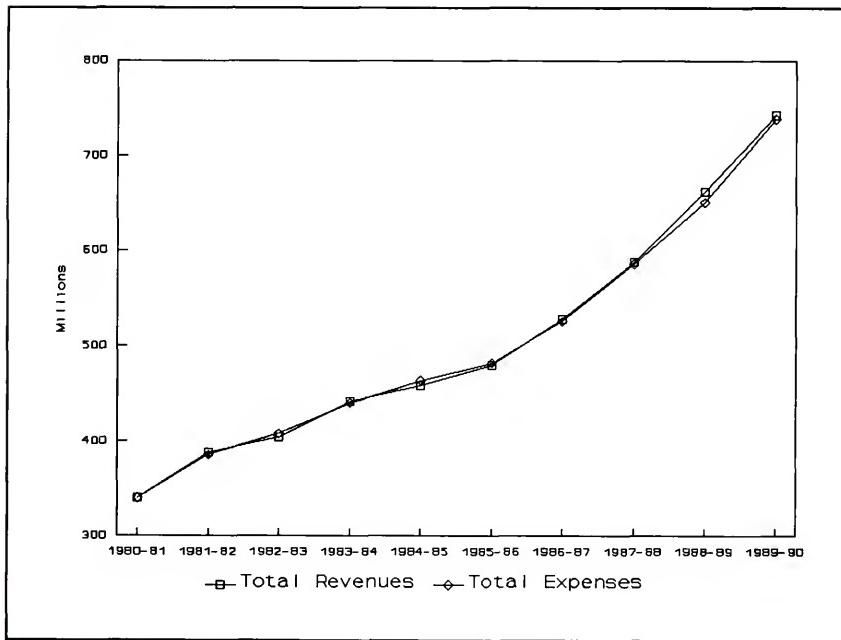


Figure D-1. Graph of total revenues and total expenses in millions of dollars for the State of Florida community colleges for the 10 fiscal years 1980-81 through 1989-90.

on the small percentage differences, the close relationship of total General Current Fund expenditures and total General Current Fund revenues on an annual basis for the period utilized in the study was established.

Table D-1

Total Current General Fund Expenditures, Revenues,
Difference, and Percent Difference

FISCAL YEAR	TOTAL EXPENSES	TOTAL REVENUES	DIFFERENCE	% DIFF.
80-81	\$340,328,649	\$340,636,612	(\$307,963)	(0.09)
81-82	385,669,848	378,833,936	(2,164,088)	(0.56)
82-83	408,074,476	404,330,838	3,743,638	0.92
83-84	440,634,637	441,713,425	(1,078,788)	(0.24)
84-85	463,980,929	458,502,847	5,478,082	1.19
85-86	482,293,510	479,591,685	2,701,825	0.56
86-87	525,394,590	527,754,495	(2,359,905)	(0.45)
87-88	585,621,397	587,623,775	(2,002,378)	(0.34)
88-89	650,602,834	662,452,595	(11,849,761)	(1.80)
89-90	\$738,720,314	\$742,529,748	(\$3,809,434)	(0.51)

The differences in expenditures and revenues were a major factor in the change of the beginning fund balance for the community college system each year. Table D-2 displays the beginning fund balances, the change in fund balance from the prior year, and the fund balance as a percent of total revenues for the 10 fiscal year periods. The beginning fund balance increased in the successive fiscal year over the previous fiscal year in all but 2 fiscal years during the 10-year period. The result of the changes was that the beginning fund balance grew from \$26,961,103 in 1980-81 to \$61,411,050 in 1989-90. As a percent of annual expenditures, the growth was a modest 0.4% from 7.9% in 1980-81 to 8.3% in 1989-90. The maximum fund balance as a

percentage of revenues was 8.7% in 1982-83 and the minimum was 6.9% in 1988-89.

Table D-2

Beginning Fund Balance, Change in Fund Balance from Prior Fiscal Year, and Fund Balance Expressed as a Percentage of Total Revenues

FISCAL YEAR	BEGINNING FUND BALANCE	CHANGE FROM PRIOR YEAR	BALANCE AS % OF REVENUES
80-81	\$26,961,103	\$9,128,887	7.9
81-82	33,132,927	6,171,824	8.5
82-83	35,359,019	2,226,092	8.7
83-84	35,656,261	297,242	8.1
84-85	39,198,156	3,541,895	8.5
85-86	37,023,699	(2,174,457)	7.7
86-87	36,709,694	(314,005)	7.0
87-88	41,173,026	4,463,332	7.0
88-89	46,022,795	4,849,769	6.9
89-90	\$61,411,050	\$15,388,255	8.3

The close relationship of total revenues and total expenses was supported by the linear regression results. Linear regression of the independent variable (y) total revenues yielded an (x) total expenses coefficient of 1.02989 with a standard error of the coefficient of 0.01112 and a large R Squared value of 0.99906 (see Table D-3).

Table D-3

Regression Output Total Expenditures Versus Total Revenues

Regression Output:	
Constant	-14744567.4497
Std Err of Y Est	4157088.8153
R Squared	0.9990681919
No. of Observations	10
Degrees of Freedom	8
X Coefficient(s)	1.0298914252
Std Err of Coef.	0.0111201879

Revenue and Expense Horizontal Equity Comparison

Per-student expenditures were calculated by dividing an institution's annual General Current Fund expenditures by the corresponding annual FTE for the institution. The per-student expenditures that were calculated for the system for each year were used to determine the six horizontal equity measures: range, restricted range, federal range ratio, coefficient of variation, McLoone index, and Gini coefficient.

The per-student expenditure range, restricted range, and federal range ratio for the community college system for each of the ten-years are listed in Table D-4. The per-student expenditure McLoone index, coefficient of variation, and Gini coefficient are listed in Table D-5.

The horizontal equity measures for total revenues are listed in Appendix E, Table E-1, E-2, E-3, E-4, E-5, and E-6. The horizontal equity measures for both per-student

Table D-4

Range, Restricted Range, and Federal Range Ratio by Year for Per-Student Expenditures

FISCAL YEAR	RANGE	RESTRICTED RANGE	FEDERAL RANGE RATIO
80-81	2335.3	1039.2	0.499
81-82	2446.0	1162.5	0.489
82-83	1747.3	863.3	0.352
83-84	2087.1	825.0	0.299
84-85	2478.2	1127.8	0.378
85-86	2883.3	1325.2	0.480
86-87	3118.1	901.2	0.288
87-88	2825.7	1403.6	0.456
88-89	3747.0	1006.5	0.283
89-90	2249.4	1081.5	0.292

Table D-5

McLoone Index, Coefficient of Variation, and Gini Coefficient by Year for Per-Student Expenditures

FISCAL YEAR	MCLOONE INDEX	COEFFICIENT OF VARIATION	GINI COEFFICIENT
80-81	0.866	16.24	0.0931
81-82	0.905	13.84	0.0755
82-83	0.906	12.01	0.0657
83-84	0.944	10.75	0.0537
84-85	0.942	9.94	0.0476
85-86	0.921	11.56	0.0559
86-87	0.919	9.17	0.0445
87-88	0.920	9.58	0.0479
88-89	0.922	10.29	0.0530
89-90	0.916	9.87	0.0545

revenues and per-student expenses were compared using percent difference (see Table D-6). With the exception of the restricted range and the federal range ratio, all other measures for all years varied by no more than -7.71% to 8.66%. The range and restricted range were not used in the revenue component analysis. Neither the revenue nor the expense federal range ratios were within the 0.25 federal standard for K-12 equity studies.

Table D-6

Equity Measurement Comparison for Expenses Versus Revenues

EQUITY MEASURE	MAXIMUM NEGATIVE PERCENTAGE DIFFERENCE	MAXIMUM POSITIVE PERCENTAGE DIFFERENCE
Range	-7.71	7.48
Restricted range	-22.68	19.25
Federal range ratio	-24.73	20.09
McLoone index	-2.29	0.81
Coefficient of variation	-0.63	7.64
Gini Coefficient	-8.73	8.66

Based on the analysis of the relationship of expenditures and revenues, revenues and revenue sources horizontal fiscal equity were interpreted as directly contributing to the resulting expenditure horizontal equity. Revenue horizontal equity and expenditure horizontal equity were considered synonymous and, therefore, allowed the

components of revenues to be treated as components of expenditures.

REFERENCES

- Ahumada, M. M. (1990). An analysis of state formula budgeting in higher education. In J. C. Smart (Ed.), Higher education: Handbook of theory and research volume VI (pp. 467-497). New York: Agathon Press.
- Alexander, K. (1982). Concepts of equity. In W. W. McMahon & T. G. Geske (Eds.), Financing education: Overcoming inefficiency and inequity (pp. 193-214). Chicago: University of Illinois Press.
- Alexander, K. (1990). Equitable financing, local control, and self-interest. In J. K. Underwood & D. A. Verstegen (Eds.), The impact of litigation and legislation on public school finance: Adequacy, equity, and excellence (pp. 293-309). New York: Harper & Row.
- Alexander, K. (1991). Equity, equality, and the common good in educational financing. In D. A. Verstegen & J. G. Ward (Eds.), Spheres of justice in education (pp. 269-294). New York: Harper Business.
- Augenblick, J. (1978a). Financing community colleges: Simulation of an equalizing formula in New Jersey. Journal of Education Finance, 3, 315-332.
- Augenblick, J. (1978b). Issues in financing community colleges. Report No. 78-2 Education Finance Center Department of Research and Information. Denver, CO: Education Commission of the States.
- Berne, R. (1980). Net price effects on two-year college attendance decisions. Journal of Education Finance, 5, 391-414.
- Berne, R., & Stiefel, L. (1984). The measurement of equity in school finance: Conceptual, methodological, and empirical dimensions. Baltimore: The Johns Hopkins University Press.
- Bowen, H. R. (1980). The costs of higher education how much do colleges and universities spend and how much should they spend? San Francisco: Jossey-Bass.

- Breneman, D. W., & Nelson, S. C. (1981). Financing community colleges: An economic perspective. Washington, DC: Brookings Institute.
- Brinkman, P. T. (1984). Formula budgeting: The fourth decade. In L. L. Leslie & R. E. Anderson (Eds.), ASHE reader on finance in higher education (pp. 333-351). Needham Heights, MA: Ginn Press.
- Brinkman, P. T., & Jones, D. P. (1991a). An examination of costs and productivity at Metropolitan Community College. Washington, DC: National Center for Higher Education Management Systems (NCHEMS).
- Brinkman, P. T., & Jones, D. P. (1991b). An examination of costs and productivity at the Nebraska technical community colleges. Washington, DC: National Center for Higher Education Management Systems (NCHEMS).
- Burrup, P. E., Brimley, V. Jr., & Garfield, R. R. (1988). Financing education in a climate of change (4th ed.). Boston: Allyn and Bacon, Inc.
- Camp, W. E., Thompson, D. C., & Crain, J. A. (1990). Within-district equity: Desegregation and microeconomic analysis. In J. K. Underwood & D. A. Versetgen (Eds.), The Impact of litigation and legislation on public school finance: Adequacy, equity, and excellence (pp. 273-292). New York: Harper & Row.
- Carrol, S. J. (1982). The Search for equity in school finance. In W. W. McMahon & T. G. Geske (Eds.), Financing education: Overcoming inefficiency and inequity (pp. 237-266). Chicago: University of Illinois Press.
- Cohn, E. (1982). Combining efficiency and equity: Optimization of resource allocation in state school systems. In W. W. McMahon & T. G. Geske (Eds.), Financing education: Overcoming inefficiency and inequity (pp. 290-311). Chicago: University of Illinois Press.
- Coons, J. E. (1980). Can education be equal and excellent? In J. W. Guthrie (Ed.), School finance practices and policies: The 1980's: A decade of conflict (pp. 131-142). Cambridge, MA: Ballinger.
- El-Khawas, E., Carter, D. J., & Ottinger, C. A. (Compilers) (1988). Community college fact book. New York: Macmillan.

Erekson, O. H. (1986). Revenue sources in higher education trends and analysis. In M. P. McKeown & K. Alexander (Eds.), Values in conflict funding priorities for higher education (pp. 41-62). Cambridge, MA: Ballinger.

Federal Register 41 (1976). pp. 26320-26321.

Fischer, F. J. (1990, January/February). State financing of higher education. Change, pp. 43-56.

Florida Statutes Vol. 1, §240.347-240.35. (1989).

Florida Statutes Vol. 1, §240.3031. (1991).

Florida Statutes Supplement Vol. 1, §240.35, pp. 553-554. (1990).

Friedman, L. S., & Wiseman, M. (1980). Toward understanding the equity consequences of school finance reform. In C. S. Benson, M. Kirst, S. Abromowitz, W. Hartman, & L. Stoll (Eds.), Education finance and organization and the research perspectives for the future: Program on educational policy and organization (pp. 35-47). Washington, DC: U.S. Department of Health, Education, and Welfare National Institute of Education.

Garms, W. I. (1977). Financing community colleges. New York: Teachers College Press.

Garms, W. I., Guthrie, J. W., & Pierce, L. C. (1978). School finance: The economics and politics of public education. Englewood Cliffs, NJ: Prentice Hall.

Gold, S. D. (1990). State support of higher education. Planning For Higher Education, 18(3), 21-33.

Gurwitz, A. S. (1982). The economics of public school finance. Cambridge, MA: Ballinger.

Guthrie, J. W., Garms, W. I., & Pierce, L. C. (1988). School finance and education policy: Enhancing educational efficiency, equality, and choice (3rd ed.). Englewood Cliffs, NJ: Prentice Hall.

Harrison, R. S. (1976). Equity in public school finance. Lexington, MA: D. C. Heath and Company.

Hiller, F. S., & Lieberman, G. J. (1986). Introduction to operations research (4th ed.). Oakland, CA: Holden-Day.

Honeyman, D., Williamson, M. L., & Wattenbarger, J. L. (1991). Community college financing 1990: Challenges for a new decade. Washington: American Association of Community Colleges National Center for Higher Education.

Jones, D. P., & Brinkman, P. T. (1990). Report on funding of Florida community colleges. In Postsecondary Education Planning Commission, Florida community college finance: Update, response to specific appropriation 634b of the 1990 general appropriations act chapter 90-209, Laws of Florida (pp. A1-A20). Tallahassee, FL: PEPC.

Jones, J. H. (1985). Introduction to school finance technique and social policy. New York: Macmillan.

Jordan, K. F., & McKeown, M. P. (1980). Equity in financing public elementary and secondary schools. In J. W. Guthrie (Ed.), School finance practices and policies: The 1980's: A decade of conflict (pp. 79-129). Cambridge, MA: Ballinger.

Keppel, G., & Zedeck, S. (1989). Data analysis for research designs. New York: Freeman & Co.

Kerr, C. (1980). Foreword. In H. R. Bowen, The costs of higher education how much do colleges and universities spend and how much should they spend? (pp. xi-xii). San Francisco: Jossey-Bass.

Kintzer, F. C. (1980). Proposition 13: Implications for community colleges. Los Angeles: University of California.

Leslie, L. L., & Brinkman, P. T. (1988). The economic value of higher education. New York: Macmillan.

Leslie, L. L., & Ramey, G. (1986). State appropriations and enrollments: Does enrollment growth still pay? In L. L. Leslie & R. E. Anderson (Eds.), ASHE reader on finance in higher education (pp. 352-365). Needham Heights, MA: Ginn Press.

Levacic, R. (1989). Formula funding for schools and colleges. In R. Levacic (Ed.), Financial management in education (pp. 136-150). Bristol, PA: Open University Press.

Lombardi, J. (1971). The financial crisis in the community college. Los Angeles: University of California.

- Lombardi, J. (1979, January). Community college financing in the post-Proposition 13 era. Junior College Resource Review, n.p.
- MacLauray, B. K. (1981). Foreword. In D. W. Breneman & S. C. Nelson (Eds.), Financing community colleges an economic perspective (pp. vii-ix). Washington, DC: The Brookings Institute.
- Martorana, S. V., & Wattenbarger, J. L. (1978). From principles and alternatives in state methods of financing community colleges and an approach to evaluation, with Pennsylvania a case state. In L. L. Leslie & R. E. Anderson (Eds.), ASHE reader on finance in higher education (pp. 385-405). Needham Heights, MA: Ginn Press.
- McClave, J. T., & Benson, P. G. (1985). Statistics for business and economics (3rd ed.). San Francisco: Dellen.
- McKeown, M. P. (1986). Funding formulas. In M. P. McKeown & K. Alexander (Eds.), Values in conflict: Funding priorities for higher education (pp. 63-90). Washington, DC: Ballinger.
- McMahon, W. W. (1982). Efficiency and equity criteria for educational budgeting and finance. In W. W. McMahon & T. G. Geske (Eds.), Financing education: Overcoming inefficiency and inequity (pp. 1-35). Chicago: University of Illinois Press.
- Mendenhall, W. (1971). Introduction to probability and statistics third edition. Belmont, CA: Duxbury Press.
- Minter, W. J., & Bowen, H. R. (1980). Preserving America's investment in human capital. [Washington, DC]: American Association of Community Colleges, American Association of State Colleges and Universities, & National Association of State Universities and Land Grant Colleges.
- Nelson, S. C. (1982). Equity and higher education finance: The case of community colleges. In W. W. McMahon & T. G. Geske (Eds.), Financing education: Overcoming inefficiency and inequity (pp. 215-236). Chicago: University of Illinois Press.
- Odden, A. (1982). State and federal pressures for equity and efficiency in education financing. In W. W. McMahon & T. G. Geske (Eds.), Financing education:

- Overcoming inefficiency and inequity (pp. 312-346). Chicago: University of Illinois Press.
- Postsecondary Education Planning Commission (PEPC). (1991). Florida community college finance: Update, response to specific appropriation 634b of the 1990 general appropriations act chapter 90-209, Laws of Florida. Tallahassee, FL: PEPC.
- Schultz, T. W. (1982). Human capital approaches in organizing and paying for education. In W. W. McMahon & T. G. Geske (Eds.), Financing education: Overcoming inefficiency and inequity (pp. 36-51). Chicago: University of Illinois Press.
- Starnes, P. M. (1975). A conceptual model for full state support of community college current operating expenses (Doctoral dissertation, University of Florida, 1975). Dissertation Abstracts International, 33, 1281A.
- State of Florida Bureau of Information Systems. (1988). Report for Florida community colleges, the fact book. Tallahassee, FL: Author.
- State of Florida Bureau of Information Systems. (1989). Report for Florida community colleges, the fact book. Tallahassee, FL: Author.
- State of Florida Bureau of Information Systems. (1990). Report for Florida community colleges, the fact book. Tallahassee, FL: Author.
- State of Florida Bureau of Information Systems. (1991). Report for Florida Community Colleges, The Fact book . Tallahassee, FL: Author.
- State of Florida Department of Education Division of Community Colleges. (1979). Report for Florida community colleges. Tallahassee, FL: Author.
- State of Florida Department of Education Division of Community Colleges. (1980). Report for Florida community colleges. Tallahassee, FL: Author.
- State of Florida Department of Education Division of Community Colleges. (1981). Report for Florida community colleges. Tallahassee, FL: Author.
- State of Florida Department of Education Division of Community Colleges. (1982). Report for Florida community colleges. Tallahassee, FL: Author.

- State of Florida Department of Education Division of Community Colleges. (1983). Report for Florida community colleges. Tallahassee, FL: Author.
- State of Florida Department of Education Division of Community Colleges. (1984). Report for Florida community colleges. Tallahassee, FL: Author.
- State of Florida Department of Education Division of Community Colleges. (1985). Report for Florida community colleges, part 1. Tallahassee, FL: Author.
- State of Florida Department of Education Division of Community Colleges. (1986). Report for Florida community colleges, the fact book. Tallahassee, FL: Author.
- State of Florida Department of Education Division of Community Colleges. (1987). Report for Florida community colleges, The Fact book. Tallahassee, FL: Author.
- Taylor, T. (1985). The state role in financing community colleges: A model for improvement. Community College Review, 13(2), 43-50.
- Tibi, C. (1988). The internal allocation of resources for education: An international perspective. In D. H. Monk & J. Underwood (Eds.), Microlevel school finance: Issues and implications for policy (pp. 81-99). Cambridge, MA: Ballinger.
- Vacca, R. S. (1975). The courts and school finance: A reexamination. In Jordan, K. F. & Alexander, K. (Eds.), Futures in school finance: Working toward a common goal (pp. 119-206). Bloomington, IA: Phi Delta Kappa.
- Vader, N. J. (1985). Strategies and adaptations for adjusting to changes in sources of revenues at selected community colleges (Doctoral dissertation, University of Florida, 1985). Dissertation Abstracts International, 86, 01A.
- van Geel, T. (1991). Equal protection and school finance: Bargained incoherence. In D. A. Verstegen & J. G. Ward (Eds.), Spheres of justice in education (pp. 297-334). New York: Harper Business.
- Wattenbarger, J. L. (1966). Implications of new developments in economics and public finance for community college administration. In S. V. Martorana

and P. F. Hunter (Eds.), Conference proceedings on administering the community college in a changing world (Buffalo Studies, Vol. II, No. 1, pp. 91-100). Buffalo, NY: The University Council for Education Administration and The School of Education State University of New York at Buffalo.

Wattenbarger, J. L. (1985). Dealing with new competition for public funds: Guidelines for financing community colleges. In W. L. Deegan, D. Tillery, & Associates (Eds.), Renewing the American community college (pp. 252-283). San Francisco: Jossey-Bass.

Wattenbarger, J. L. (1991). Assessment and success. In D. Angel & M. DeVault (Eds.), Conceptualizing 2000 proactive planning (pp. 113-121). Washington, DC: The Community College Press.

Wattenbarger, J. L., & Mercer, S. L. (1988). Financing community colleges. Gainesville, FL: Institute of Higher Education.

Wattenbarger, J. L., & Starnes, P. M. (1986). Financing community colleges. Gainesville, FL: Institute of Higher Education.

Webster's new collegiate dictionary. (1981). Springfield, MA: G. & C. Merriam Company.

Wood, R. C., & Honeyman, D. S. (1990). How public schools are financed. Reston, VA: Association of School Business Officials International.

Wood, R. C., Jones, H. B., & Riley, L. R. (1984). The pursuit of equity in financing public education. In J. E. Clark & K. Hertz (Eds.), Major topics of business management in the mid 1980's (pp. 1-9). Reston, VA: Association of Business School Officials.

Woodbury, K. B. (1983). Fair share of funding unmet goal for colleges. Community and Junior College Journal, 53 (6), 22-25.

BIOGRAPHICAL SKETCH

The author of this dissertation is George Wesley Harrell. His educational background includes a Bachelor of Science in Industrial Engineering (1972) and a Master of Business Administration in finance (1988). Both degrees were earned at the University of Florida in Gainesville, Florida. Mr. Harrell's work experience includes 11 years with Eastern Airlines in several positions including Manager Financial Control and Administration, Manager Ramp Service Support, and Manager Building Services. At the time of the completion of this dissertation, he was the Associate Director of Physical Plant for the University of Florida in Gainesville, Florida. He was awarded the degree of Doctor of Philosophy in higher education administration with emphasis on higher education finance in May, 1992.

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

James L. Wattenbarger

James L. Wattenbarger, Chair
Distinguished Service
Professor of Educational
Leadership

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

David S. Honeyman

David S. Honeyman, Cochair
Associate Professor of
Educational Leadership

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

R. Craig Wood

R. Craig Wood
Professor of Educational
Leadership

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

John H. James

John H. James
Associate Professor of
Management

This dissertation was submitted to the Graduate Faculty of the College of Education and to the Graduate School and was accepted as partial fulfillment of the requirements for the degree of Doctor of Philosophy.

May, 1992

David C. Snedden

Dean, College of Education

Madelyn Lockhart

Dean, Graduate School

UNIVERSITY OF FLORIDA



3 1262 08285 307 7